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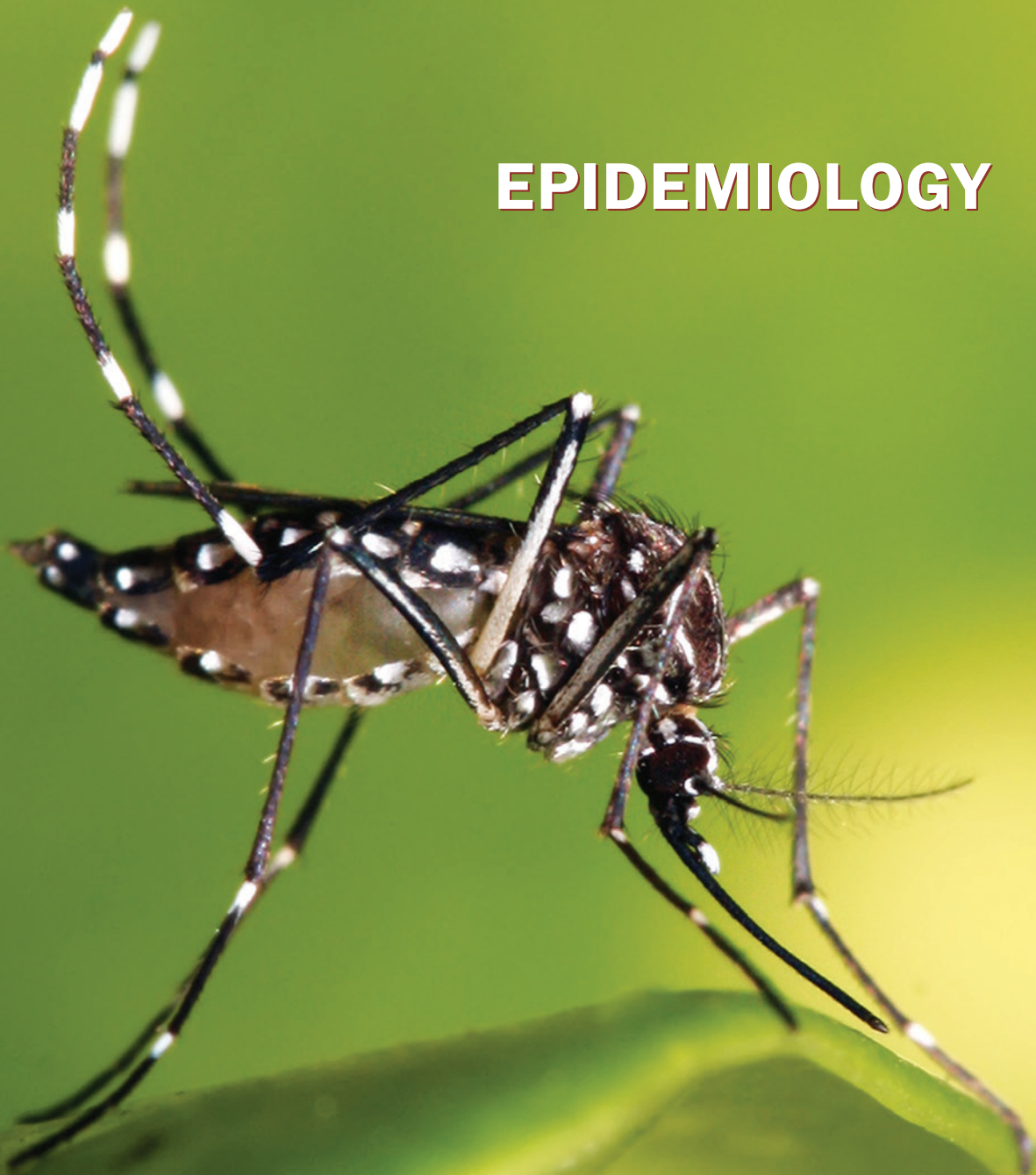
Sonoma Medicine

EPIDEMIOLOGY



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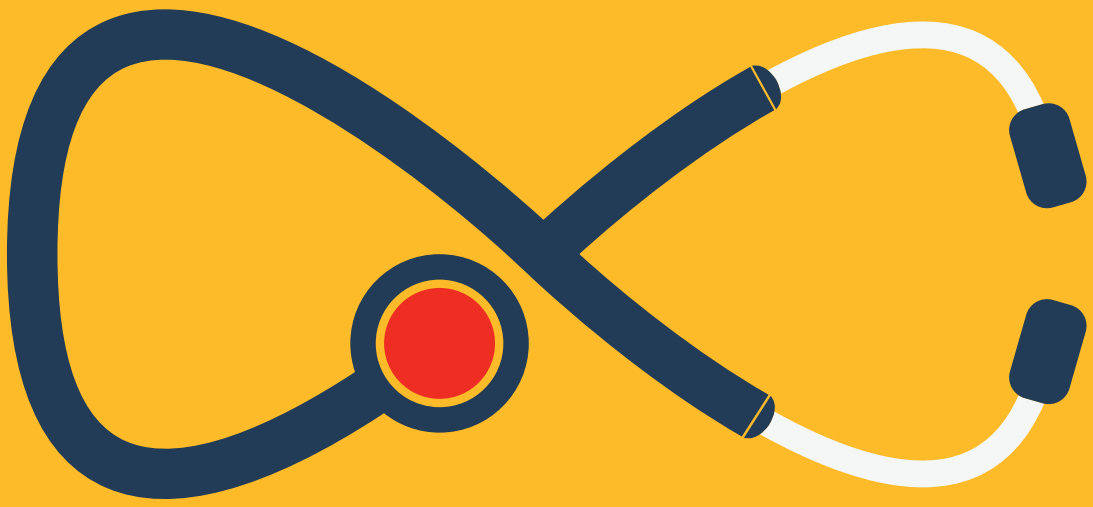

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The magazine of the Sonoma County Medical Association

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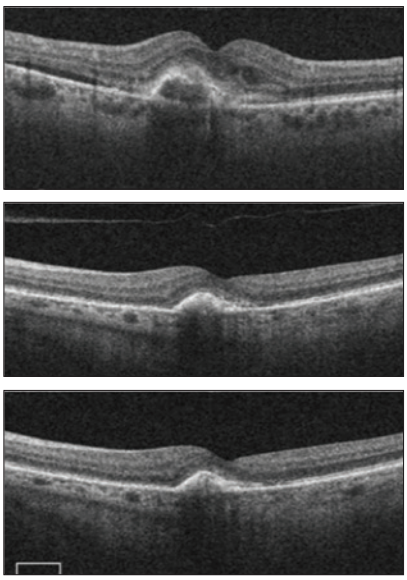

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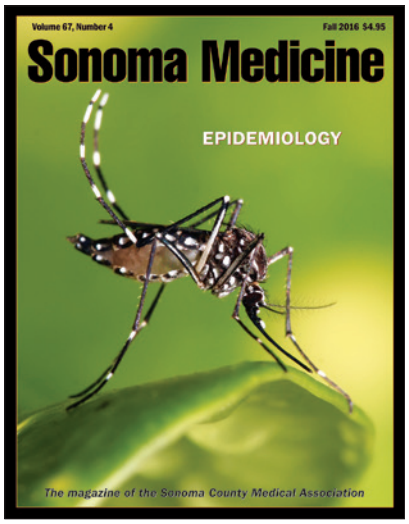

Cover: Aedes aegypti, *a mosquito that transmits Zika, dengue and chikungunya viruses. Photo by Muhammad Mahdi Karim.*

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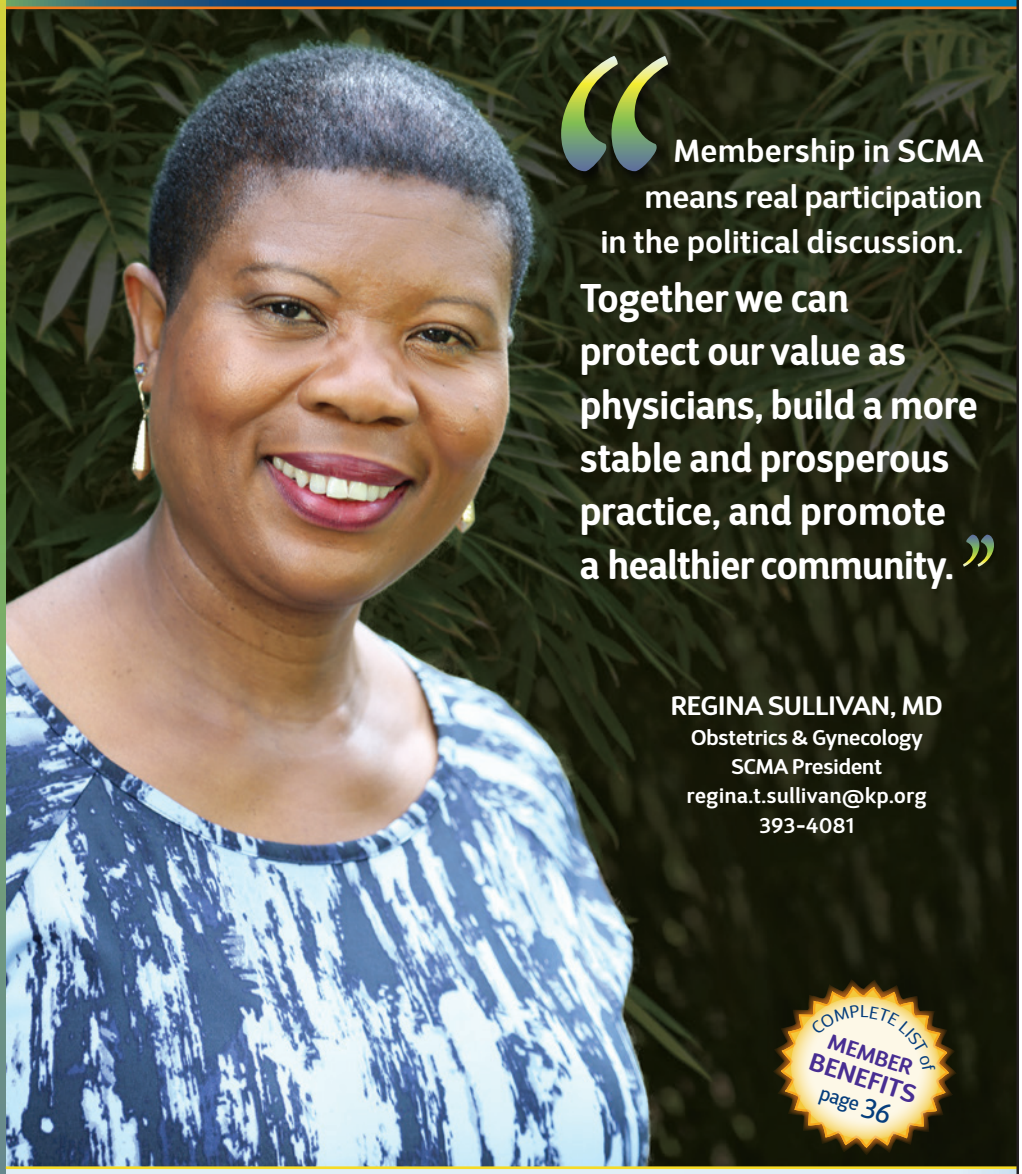

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Bending the Curve

Sanjay Dhar, MD

News outlets and social media are constantly screaming at us about obesity statistics showing that nearly two-thirds of adult Americans are at an unhealthy weight. These statistics could be the cornerstone of a national campaign to get Americans to eat healthier and exercise more, but that is not the case, given the increased incidence of hypertension, diabetes and other chronic ailments. In spite of this depressing situation, there is one important statistic that is often overlooked: Even with all these ailments, our life span is longer today than ever.

Thanks to advances in medicine, especially in the field of cardiology, people are living longer with chronic diseases. Below are several case scenarios that would formerly have led to premature death.

Heart attack and heart disease are still the No. 1 killers of Americans, but advances in managing acute heart attack in all age groups, innovations in delivery technology, and increased speed of care coordination have led to fewer long-term comorbidities and subsequent complications. It's not surprising for a patient presenting at the emergency department with a heart attack to be back on a golf course within a week.

Pacemaker implantation in patients with complete heart block has seen remarkable innovation in recent years. Without a pacemaker, patients in complete heart block may be extremely limited in their daily activities or even be deceased. The next generation of miniature, leadless, longer-lasting and MRI-compatible implants will take cardiac rhythm management to a higher level.

Implantable cardioverter-defibrillators in patients with sudden cardiac death have improved by leaps and bounds. Life after a sudden cardiac death experience is fraught with constant fear of the next event. ICDs have taken that fear away. Further, miniaturization of the bulky devices has led to their use with even our frailest patients. Advances in the field of electrophysiology have allowed surgeons to implant these devices prophylactically in patients who are at the greatest risk of having a major cardiac event.

Valve replacement used to require an open-heart procedure, which is quite dangerous for very sick and very old patients. With the arrival of transcatheter aortic valve replacement (TAVR) and implantation (TAVI), these patients have received a new lease on life. The minimally invasive TAVR procedure, similar to putting a stent in the coronary artery, repairs the aortic valve without removing the old, damaged valve. Instead, it wedges a replacement valve into the aortic valve's place to help remove the restriction of blood flow from the left ventricle. I have witnessed several TAVR success stories, including a 97-year-old patient of mine who was in severe end-stage heart failure but went line dancing one week after getting a TAVR. The advances in minimally invasive cardiac surgery will extend to other fields in medicine and ultimately result in a more humane way of dealing with severe clinical situations.

A left ventricle assist device (LVAD) can be attached to the heart to help people whose hearts are too weak to pump blood. LVAD is usually reserved for end-stage heart failure when all other therapies have failed. Some patients use LVADs while awaiting heart transplant surgery. This use is called "bridge to transplantation." Patients who aren't eligible for heart transplant surgery may still benefit from an LVAD by keeping it for the long term. This use is called "destination therapy."

Heart transplants are the ultimate surgical maneuver and are now performed routinely, with longer survival data, to help prolong precious human life. Transplants have also led to significant improvements in chronic immunosuppression therapy to avoid transplant rejection.

These scenarios wouldn't be possible without the hundreds of thousands of scientists, researchers, biomedical engineers, entrepreneurs and dreamers who have worked behind the scenes to bend the curve in spite of all the odds stacked against us. The next generation of advances in nanotechnology, genetics and stem-cell therapy will continue to make lives better for all of us. ◇

Dr. Dhar is a Santa Rosa cardiologist.

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Zika and Other Emerging Arboviruses

Kenzie Gardner, BSN, RN, Dale Westrom, PhD, MD

The introduction of locally transmitted Zika virus into the United States has highlighted the distress that an epidemic of an untreatable, vector-borne and sexually transmitted disease can create. This distress is similar to that caused by the recent ebola and avian influenza epidemics in other parts of the world. Although certain diseases (including ebola and avian influenza) have a low probability of affecting people living in the United States, other viruses borne by arthropods (arboviruses) are emerging in the U.S. and may affect Sonoma County and the rest of California. Local residents already encounter risk by traveling to areas where arboviruses, especially those borne by mosquitos, are actively spreading. Infected travelers can further transmit the virus to their sexual contacts and transplacentally to their unborn babies.

Mosquito-borne infections in North America are rare. The least rare is West Nile virus, followed by the viruses for eastern equine encephalitis, western equine encephalitis, St. Louis encephalitis and LaCrosse encephalitis. Since 2003, more than 5,700 cases of West Nile virus have been reported in California.[1]

Ms. Gardner is a doctoral candidate in nursing at Duke University; Dr. Westrom is a Santa Rosa dermatologist with a doctorate in parasitology and a special medical interest in travel medicine.

Sonoma County had one case in 2005 and one in 2007, but none since.[2]

In recent years, however, new arboviruses have emerged in North America that could result in significant human morbidity and mortality. These include the chikungunya, dengue and Zika viruses. Only a few travel-associated arbovirus infections have been reported in Sonoma County residents, but the emergence of new arboviruses increases the risk of locally transmitted disease and warrants further education on the topic. This article focuses on epidemiology, clinical manifestations, treatment and prevention of these viruses.

Epidemiology

There are four main families of arboviruses: Togaviridae, Flaviviridae, Benyaviridae and Reoviridae. Arboviruses require an arthropod vector—such as a mosquito, tick or sandfly—to facilitate transmission, which often occurs in areas conducive to arthropods.[3] Of note, the increasing number of mosquitos in Sonoma County is attributed to warmer weather and extreme drought followed by flooding.[4] Many arboviruses are zoonotic (having animal reservoirs) although some can be transmitted directly among humans. Factors contributing to the emergence of arboviruses include globalization, increases in plant and animal transport, human travel, population density, arthropod dispersion, and virus mutation.[5]

Over 300 types of mosquitos (family Culicidae) are capable of transmitting arboviruses. West Nile virus is transmitted by mosquitos in the *Culex* genus, but chikungunya, dengue and Zika viruses are transmitted by mosquitos in the *Aedes* genus.[6] *Aedes* mosquitos, in particular *A. aegypti* and *A. albopictus*, are fierce daytime biters, compared to the *Culex* mosquitoes, which prefer to bite at dawn or after dusk.[7] Although *Culex* mosquitos are common in Sonoma County, neither *A. aegypti* nor *A. albopictus* have been detected here. However, *A. aegypti* has been detected in both Alameda and San Mateo counties.[8] Mosquitos in the *Aedes* genus are established in many counties in central and southern California. They adapt well to peridomestic environments and have become resistant to conventional spraying in some parts of the world[9] It is possible that invasive *Aedes* mosquitos will be introduced into Sonoma County and become established.

Dengue virus (family Flaviviridae) is mainly spread by *A. aegypti* and is the most common arbovirus worldwide (the most common in the U.S. is West Nile). Forty percent of the global human population is at risk of transmission, and between 50 and 100 million people are infected with dengue virus every year.[10] Dengue is endemic in more than 100 countries, mainly in South Asia, Southeast Asia, Central America and South America. More than 260 confirmed

cases of dengue were reported in the Hawaiian Islands from fall 2015 to spring 2016.[11] In California, more than 100 cases of travel-associated dengue have been reported so far this year, including four in Sonoma County.[12]

Chikungunya virus (family Togaviridae) is transmitted by both *A. aegypti* and *A. albopictus*. Animal reservoirs include monkeys, birds and rodents. Chikungunya underwent a mutation in 2005, enhancing its geographic spread and ability to infect humans.[13] An estimated 3 million chikungunya infections occur worldwide each year.[14] The first locally transmitted case of chikungunya in the U.S. occurred in Florida in 2014.[15] Fifteen cases of travel-associated chikungunya have been reported in California so far this year, but none in Sonoma County.[16]

Zika virus (family Flaviviridae) is also transmitted by *A. aegypti* and *A. albopictus*. Zika was originally isolated from a rhesus monkey in the Zika Forest of Uganda in 1947, and the first human infected by the virus was a young Nigerian female in 1954.[17] We are still learning about Zika, including routes and other parameters of transmission. Zika has been identified in multiple body fluids (e.g., blood, urine, semen, vaginal fluids, saliva), some for prolonged periods (e.g., semen). Zika is transmitted transplacentally and is the only known arbovirus that can be transmitted through sexual contact.[18]

The FDA recently recommended testing all donated blood for Zika. So far this year, more than 2,250 travel-associated Zika cases and more than 20 sexually transmitted Zika cases have been confirmed in the United States.[19] In California, 260 travel-associated cases of Zika virus have been reported this year, including five in Sonoma County.[20] In July, the first locally transmitted cases in the U.S. were reported in Florida, where four people acquired the disease in Miami-Dade County.[21] The total of locally transmitted Zika cases in Florida is now more than 40.[22] In August, the U.S. Department of Health and Human Services declared a public health emergency in Puerto Rico when 1,914 new cases were reported in one week, for a total of 10,690 cases since the first one was reported in December 2015.[23]

Many factors (including failure to diagnose or misdiagnosis) contribute to worldwide underestimation of arbovirus incidence, prevalence and disease burden. Access to health care resources, standardized testing, and means of documentation and reporting are necessary for proper identification and prevention of arboviruses.

Table 1. Clinical Manifestations of Zika, Dengue and Chikungunya

	Zika	Dengue	Chikungunya
Conjunctivitis	✔		
Congenital Abnormalities	✔		
Neurologic Complications	✔		
Arthralgia/Myalgia	✔	✔	✔
Headache	✔	✔	✔
Fever	✔	✔	✔
Hemorrhage/Shock		✔	
Rash	✔	✔	✔

Dengue, chikungunya and Zika are transmitted from similar vectors, which allows for co-circulation and co-infection. A recent case report described a pregnant woman in Colombia who was co-infected with dengue, chikungunya and Zika.[24] Also, the varying durations of viremia and viruria and serologic cross-reactivity among flaviviruses (e.g., dengue, Zika, yellow fever, Japanese encephalitis virus) significantly complicate testing and interpretation of tests.

Clinical Manifestations

Clinical manifestations of dengue, chikungunya and Zika are difficult to distinguish because the human host can have a range of nonspecific, subclinical to severe symptoms (Table 1). Thus it is invaluable to conduct thorough travel, environmental exposure and sexual histories on every patient with possible arbovirus exposure. Arborvirus infection should be added to the differential diagnosis for travel-related diseases, including fever, malaria and typhoid. Patients presenting with fever, rash, conjunctivitis, arthralgia, myalgia, headache, hemorrhage and/or shock should be evaluated for an arbovirus infection, especially if they have recently traveled to an endemic area or have had contact with someone who has traveled to an endemic area.

Patients with dengue may exhibit fever, rash, arthralgia, myalgia, headache, hemorrhage and/or shock. A fever is characteristic of dengue and may vary from low grade to 105° F. Children may experience febrile seizures. Severe thrombocytopenia, hemorrhage and shock are characteristic of severe dengue disease.[25]

The word *chikungunya* originated in Tanzania and means "to become contorted" because the disease typically causes debilitating arthralgias (without arthritis) that are accompanied by acute fever. Usually the virus is self-limiting, but severe, atypical cardiac and neurologic presentations of the disease were observed during a 2005-06 epidemic in Réunion, an island in the Indian Ocean.[26]

The exact incubation period of Zika is unknown but is proposed to be a few days to two weeks. As with West Nile virus, approximately 80% of infected patients will not recognize symptoms. Typical symptoms include fever, maculopapular rash, conjunctivitis, myalgia, arthralgia, fatigue and headaches.[27] The presence of conjunctivitis may help to differentiate Zika from dengue and chikungunya. Symptoms commonly last

2–7 days, but Zika in pregnant women is a public health concern because of complications, especially those impacting pregnancies and fetal health.

Zika infections during pregnancy can cause birth defects and other serious brain anomalies. The reported spectrum of adverse events includes pregnancy loss, microcephaly, brain and eye abnormalities, poor intrauterine growth, and placental insufficiency. Late sexual transmission of Zika is related to the persistence of virus in semen for up to six months.[28] The risk of Zika virus to pregnant women and the possible routes of exposure (e.g., travel to areas with active transmission, sexual contact with travelers) should be communicated to **all** pregnant women and to all women of childbearing age who are engaging in sexual intercourse, along with their spouses or partners. Guillain-Barré syndrome and other neurological complications have also been reported in Zika.[29]

If patients in Sonoma County have symptoms suspicious of Zika or another arbovirus and have been in an endemic area or had sex with an exposed partner, blood and urine specimens should be collected within 21 days of symptom onset. All asymptomatic pregnant women who have traveled through a Zika-endemic area or had sex with an exposed partner should also be tested. The Sonoma County Public Health Disease Control Unit (707-565-4566) should be contacted immediately to report exposures and discuss appropriate testing for the patient. Commercial testing for Zika is underway but not yet available.

Treatment and Prevention

Only limited therapies are available for dengue, chikungunya and Zika. Instead, recent research is focused on vector management and supporting the development of a Zika vaccine. A current trial of a genetically engineered male *A. aegypti* has been developed to sterilize female mates and subsequently lower the mosquito population.[30] The trial is controversial because of the unknown long-term environmental impact on mosquitos and other species. The latest estimates push the timeline for development of a vaccine to 2018.[31]

Preventing contact with mosquitos is key to limiting the spread of arboviruses. If possible, it's best to stay indoors and avoid vector breeding areas, such as stagnant water. When going outdoors, cover skin with clothing and apply DEET insect repellent to exposed areas. People traveling to endemic areas should take extra precautions. Pregnant women are advised not to travel to Zika-endemic areas or impacted areas of Florida.[32] If an arbovirus is suspected, aspirin and NSAIDs should be avoided to prevent hemorrhagic events in dengue and Reye's syndrome in children.

Conclusion

Zika, chikungunya and dengue are emerging rapidly worldwide. Sonoma County residents are at risk for viruses through travel and (with Zika virus) sexual contact with travelers. In time, the county may also face the risk of locally transmitted arboviruses. Only limited therapies are available to treat or prevent disease caused by arboviruses. Basic awareness of the epidemiology, clinical manifestations, treatment and prevention of emerging arboviruses is vital to preventing local transmission of these diseases. (Clinical practice goals for arbovirus are shown in the sidebar.)

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Goals for Clinical Practice: Arbovirus

The following goals are intended to enhance clinical awareness of emerging arboviruses:

- Stay abreast of current news and evidence-based research on the emergence of arboviruses, including geographic locations of active disease transmission.
- Know how to identify symptoms associated with an arbovirus infection.
- Report possible arbovirus infections to the Sonoma County Public Health Disease Control Unit (707-565-4566).
- Encourage prevention strategies for all patients, especially those traveling to endemic areas.
- Ask patients to visit these websites for information on arboviruses:
  - sonomacounty.ca.gov/health/Zika-virus
  - www.cdph.ca.gov/HealthInfo/discond/pages/Zika.aspx
  - www.cdc.gov/Zika/fs-posters
- Conduct thorough travel, environmental exposure and sexual histories on all patients and discuss current literature and recommendations with patients considering pregnancy.
- Support the Marin/Sonoma Mosquito & Vector Control District.
- Support ongoing research on emerging arboviruses, treatment therapies, and vector transmission control that does not harm animals or the environment.
- Encourage global guidelines to monitor disease burden and establish standards of care.

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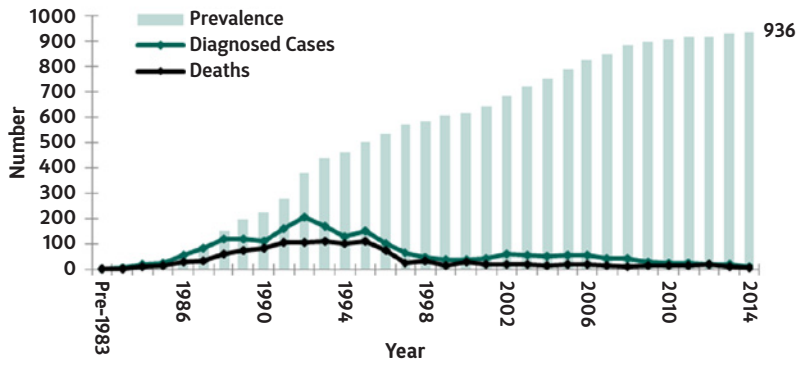
Ending the HIV Epidemic in Sonoma County

Danny Toub, MD, AAHIVS

Figure 1. Sonoma County AIDS Cases by Year of Diagnosis and Death, with Cumulative Prevalence



Jose," a 34-year-old man seen at a routine office visit, was due for regular diabetes lab monitoring. With a standing order, the medical assistant advised him that he would be tested for HIV and that if he tested positive, treatment would be available. Routine antigen/antibody HIV testing confirmed HIV diagnosis in this asymptomatic patient, and he was rapidly linked to care with an HIV specialist. His wife, "Maria," was identified as HIV-negative and placed on pre-exposure prophylaxis to prevent HIV acquisition. Jose currently has an undetectable HIV viral load and is taking one pill once daily for treatment. He and Maria are discussing plans to have an HIV-negative baby.

The most recent *National HIV/AIDS Strategy for the United States* offers this vision: "The United States will become a place where new HIV infections are rare and when they do occur, every person regardless of age, gender, race/ethnicity, sexual orientation, gender identity or socio-economic circumstance, will have unfettered access to high quality, life-extending care, free from stigma and discrimination."[1]

The World Health Organization has gone a step further by committing to ending the HIV epidemic by 2030. Their target for 2020 is that "90% of people living with HIV know their status, 90% of people living with HIV who know their status are receiving treatment, and 90% of people on treatment have suppressed viral loads."[2]

Globally, HIV incidence began to decline in 1997, and the scale-up of antiretroviral treatment worldwide has been one of the greatest public health success stories over the last 20 years. Thirty five years into the HIV/AIDS epidemic, we have an unprecedented opportunity to end HIV transmission in Sonoma County, which has had an uncommonly high HIV prevalence for a U.S. rural or semi-rural area.[3] After a decline from the peak of the AIDS epidemic in the early 1990s, the annual number of newly diagnosed HIV infections in Sonoma County remained relatively stable at approximately 40 per year for close to a decade, but it appears that the number of newly diagnosed cases per year is declining again (Figure 1).

The county's HIV epidemic has remained mostly among white men who have sex with men (MSM), who now have declining rates of HIV. In contrast, rates have been stable in women and in Latinos. The proportion of people with new HIV diagnoses in the county without a known or reported risk factor has tripled from 6% in 2000–2004 to 18% in 2010–2014. Unlike the declining rates of HIV, rates of bacterial sexually transmitted infections (chlamydia, gonorrhea, and syphilis) have all been increasing in the last several years in Sonoma County.[4]

Antiretroviral Therapy (ART)

Morbidity and mortality from HIV have dropped precipitously since the advent of combination antiretroviral therapy (ART) 20 years ago. In addition to the personal health benefits of ART, lowering the community viral load by

Dr. Toub is on faculty for the AIDS Education and Training Center and provides HIV consultation at Santa Rosa Community Health Centers.

expanding access to ART has profound implications for bending the curve to end the HIV epidemic. The most effective way to prevent the spread of HIV is to offer ART to **all** patients infected with HIV. Treatment lowers viral load, and less virus results in fewer new infections. This intuitively obvious statement has been validated: a recent randomized controlled trial of 1,763 sero-different couples, for example, showed that ART reduces HIV transmission by 93%.[5]

ART is currently recommended as soon as possible after HIV infection, regardless of CD4 count. The current standard of care in San Francisco is to begin ART within 24 hours after diagnosis.[6] Nearly all newly diagnosed patients can be treated with one of the six different one-pill, once-daily fixed dose combinations approved by the FDA to treat HIV.[7] About 90% of Sonoma County patients with HIV who are being treated with ART are fully suppressed (i.e., blood tests show no measurable virus).[8] Universal viral suppression among people living with HIV can only happen if they are diagnosed, linked and retained in medical care.

Pre-exposure Prophylaxis (PrEP)

In addition to timely diagnosis and treatment of HIV-infected patients, new strategies target those at risk for acquiring HIV. Pre-exposure prophylaxis (PrEP) is an effective but underused tool that can be expected to help end the HIV epidemic. Treating high-risk patients with daily oral PrEP with the fixed-dose combination of tenofovir disoproxil fumarate (TDF) 300 mg and emtricitabine (FTC) 200 mg (Truvada) has proved safe and effective in reducing the risk of sexual HIV acquisition in adults.[9] The FDA approved TDF/FTC in 2012 for PrEP, and the CDC guidelines recommend offering PrEP to patients in these high risk groups: men who have sex with men (MSM), adult injection drug users, and heterosexually active men and women who are at substantial risk of HIV acquisition.[9]

PrEP works extraordinarily well to prevent HIV (92% in MSM who adhere to treatment), compared to only 63–80% effectiveness for condoms.[10] PrEP is prescribed using a well-defined protocol that includes close clinical follow-up and lab monitoring at least every three months to rule out newly acquired HIV infection. A new California law (AB 2640), still on the governor's desk for signing as this article goes to press, will require medical care providers to give information about PrEP and other prevention and risk-reduction methods to patients who are at high risk for HIV but test negative for HIV infection.

Many people who can benefit from PrEP aren't taking it. The CDC estimates that people at high risk who should be offered PrEP include about 1 in 4 sexually active gay and bisexual men, 1 in 5 people who inject drugs, and 1 in 200 sexually active heterosexual adults. In the U.S., patients with indications for PrEP include about 624,000 heterosexually active adults, 492,000 men who have sex with men, and 115,000 people who inject drugs.[11]

If more health care providers know about and prescribe PrEP, more HIV infections could be prevented. PrEP is fully accessible locally (regardless of insurance status) at Kaiser, Planned Parenthood, Santa Rosa Community Health Centers and West County Health Centers (sidebar). Additional resources include PleasePrEPMe.org and the Bay Area & North Coast AIDS Education and Training Center, which can help providers learn how to prescribe PrEP to keep their patients HIV-negative.

PrEP Providers and Consultants in Sonoma County

Kaiser Permanente
thrive.kaiserpermanente.org/care-near-you/northern-california/santarosa/departments/infectious-disease

Planned Parenthood
www.plannedparenthood.org/health-center/california/santa-rosa

Santa Rosa Community Health Centers
www.srhealthcenters.org/vida

West County Health Centers
www.wchealth.org/service/hiv-services

Bay Area & North Coast AIDS Education and Training Center
bayareaaetc.org/contact-us

Universal Screening for HIV

With the availability of safe, tolerable, effective and accessible HIV treatment, the greatest risk to HIV-infected people is that their infection is not diagnosed. Medical providers are now charged with normalizing HIV testing and changing the culture so that all people age 15–65 know their HIV status. For the past decade, the CDC has recommended one-time opt-out HIV screening for all adults,[12] and annual screening for adults with risk factors. In 2013, the U.S. Preventive Services Task Force recommended that clinicians screen for HIV infection in adolescents and adults aged 15 to 65.[13] Since 2014, California law (AB 446) has required that each patient who has blood drawn at a primary care clinic be offered an HIV test. Yet, despite all these evidence-based recommendations, many adolescents and adults in Sonoma County have not yet had an HIV test.

HIV testing of all adults can follow the precedent of normalizing HIV testing during prenatal care: nearly all pregnant women now get an HIV test during routine prenatal care. This wonderful success has nearly eliminated perinatal transmission of HIV in the U.S.[14] As evidence, the most recent domestically acquired pediatric HIV infection in Sonoma County occurred in 2000.

Santa Rosa Community Health Centers is working hard to ensure that 75% of its patients older than 15 know their HIV status by the end 2017.[15] As physicians move closer to eliminating HIV transmission in Sonoma County, they will need more resources to address social determinants of health and to test lower-risk populations. Widespread testing and linkage to care enables people living with HIV to access treatment early, and to reduce stigma.

Getting to Zero

Sonoma County can follow San Francisco's lead on the path to "Getting to Zero": zero new HIV infections, zero HIV deaths, and zero HIV stigma.[16] This challenging work will involve case finding and surveillance, transmission interruption, systematic treatment and case management, and population-based

monitoring.[17] Opportunities to improve the HIV care continuum include diagnosing the undiagnosed, linking the diagnosed to care, retaining patients with HIV in medical care, and achieving viral suppression for patients living with HIV.[18]

A recent study estimated that more than 90% of HIV transmissions come from people who are either undiagnosed or diagnosed but not retained in medical care.[19] Californians currently have a 1-in-102 lifetime risk of acquiring HIV, but disparities exist among risk groups.[20] Half of black gay men and a quarter of Latino gay men, for example, are projected to be diagnosed within their lifetime. Focusing culturally competent treatment and prevention on our most vulnerable populations to achieve health equity is essential to ending HIV.

Sonoma County has a long history of expertise in addressing the HIV epidemic and a strong collaboration among HIV experts. But HIV experts cannot do it alone: they need local primary care and specialist physicians to become involved in HIV testing and prevention in order to end HIV in Sonoma County. As described above, physicians should (1) offer ART to all patients infected with HIV, (2) identify patients at risk for HIV and offer PrEP as indicated and (3) test all patients 15–65 for HIV.

If the use of HIV testing and prevention services continues to increase, patients like Jose and Maria will raise their children in a community without new HIV infections. ◇

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Stemming the Tide

Jerome Minkoff, MD

Table 1. Blood Test Levels for Diagnosis of Diabetes and Prediabetes

	A1C (percent)	Fasting Blood Glucose (mg/dL)	Oral Glucose Tolerance Test (mg/dL)
Diabetes	≥6.5	≥126	≥200
Prediabetes	5.7–6.4	100–125	140–199
Normal	≤5.6	≤99	≤139

SOURCE: American Diabetes Association

If you think diabetes mellitus is a scourge on our population, you are in good company. The AMA, the CDC and even Congress have endorsed the National Diabetes Prevention Program in an effort to forestall worsening morbidity from diabetes mellitus (hereinafter referred to as "diabetes").

Diabetes is on the rise. The genetic determinants of diabetes are complex, but development of overt diabetes is clearly correlated with obesity. As obesity increases throughout the developed world, the prevalence of type 2 diabetes comes along with it—a consequence of increased insulin resistance associated with more adipose tissue. Sedentary lifestyle, increased caloric intake and aging all contribute to insulin resistance. The pancreatic beta cells can supply more insulin for a while but, at some point, the insulin secretion is insufficient to maintain normal serum glucose levels, resulting in the higher glucose levels associated with diabetes.

The prevalence of diabetes in our adult population has more than doubled over the past two decades. Twelve percent of American adults have type 2 diabetes, and by the time they are diagnosed, 50% of those adults have signs or symptoms of complications associated with overt diabetes, such as microalbuminuria or neuropathy. Microvascular complications such as retinopathy and nephropathy are preventable with good glucose control, so identifying patients with diabetes is essential (Table 1).

The intravascular inflammation associated with insulin resistance and type 2 diabetes can result in atherosclerotic complications independent of glucose levels. Increased free fatty acids, lipid abnormalities and abnormal clotting dynamics all make cardiovascular events more likely.

We can improve CV outcomes by controlling hypertension in diabetic and other patients at high risk of CV events. Once diabetes is diagnosed, treatment with cardioprotective medications improves morbidity and mortality. Treatment with aspirin, statins, ACE inhibitors or ARBs can also markedly improve outcomes in our highest-risk patients.[1]

Screening patients with annual fasting glucoselevels is a cost-effective way of determining whether they have prediabetes or are developing type 2 diabetes. Starting at age 40, patients with any of the following risks should be screened:

- family history of type 2 diabetes
- history of gestational diabetes
- polycystic ovary syndrome
- glucocorticoid excess
- insulin resistance syndrome

Each component of the insulin resistance syndrome (also known as metabolic syndrome, dysmetabolic syndrome or syndrome x) increases the risk of diabetes and CV events.[2] The components include obesity, high triglycerides, low HDL, hypertension and glucose intolerance (prediabetes). Usually we decide on treatment with statins and ASA based on CV risk according to ATP III guidelines,[3] yet the CV risk calculators[4] do not include all metabolic syndrome factors, despite evidence that each increases risk for CV complications. Even family history of early MI is not included in the risk calculator. This suggests that we should err on the side of treating with CV protective medications in those patients on the borderline if they also have prediabetes or family history of CV disease or hypertriglyceridemia.

Other associated risks, such as microalbuminuria and hyperuricemia, may be harbingers of diabetes risk. Certain ethnic groups also have increased diabetes risk, including Hispanics, Polynesians, African Americans, Native Americans, and South Asians.

Can we stem the tide of diabetes? It is possible. Plenty of evidence shows that progression from prediabetes to overt diabetes can be prevented. In one study, three years of an intensive lifestyle intervention (including

Dr. Minkoff, an endocrinologist, recently retired from Kaiser Permanente Santa Rosa.

increased exercise and moderating caloric intake) decreased the incidence of diabetes by 58% compared to placebo intervention.[5] In the same study, metformin decreased incidence by 31% compared to placebo. Although the effect of less stringent programs may be less impressive, the ability to prevent incident diabetes has been confirmed in several other studies and programs.[6]

Patients at risk for diabetes should be screened annually. Fasting blood glucose or HbA1c may be the easiest test. I prefer FBG because one can also determine triglyceride levels, an important CV risk factor. Patients with FBG scores of 110–125 mg/dL and/or multiple risk factors for diabetes should be counseled to lose weight through caloric restriction and increased exercise.

There are many diabetes prevention programs in Sonoma County for patients known to have prediabetes or sufficient risk of diabetes. These programs require a referral from a physician and are quite successful.

Participants in the Sonoma County Family YMCA program average 3–5% weight loss, sustained over the year-long program.[7] These patients were able to reduce portion size, increase physical activity and endorse an improvement in their overall health. To refer patients, call 707-545-9622 or email nmartinovich@scfymca.org. A sliding scale is available for patients with limited means.

The Center for Well-Being hosts diabetes prevention classes that have produced similar results. Call 707-575-6043 or visit norcalwellbeing.org to refer patients.

Diabetes prevention classes for Kaiser members can be accessed on line at kp.org.

Identifying patients at risk for developing diabetes is the easy part. The difficulties arise due to patient and physician complacency. We need to remind our patients how important it is to take control of their risks and to enroll in diabetes prevention programs of proven benefit. ◇

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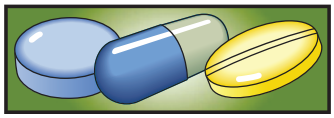

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* http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm101653.htm

Building the New

Andrew Luckett, MD

Recently I ran the longest race of my life. It wasn't a marathon, or even a half-marathon. Just a 5K, 3.1 miles. It was the Heroes for Health Fun Run, where kids wore capes and adults dressed like superheroes to raise money for the Northern California Center for Well-Being's healthy living programs for children. Given that I had never run such a long race, I have to admit that part of me was intimidated. *Will I be able to do it? I haven't even run this much on a treadmill,* I thought. Nevertheless, I committed myself to run the race because I believed in the importance of the Center for Well-Being's goal.

As a resident and now a fellow in Sutter Santa Rosa's family medicine residency, I've seen plenty of children who, according to statistics, will develop diabetes, high blood pressure and heart disease years earlier in their life than their parents and grandparents because they haven't had the opportunity to learn how to live a healthy life. No one person is at fault here; this is a multifactorial problem. Nevertheless, the public health programs at the Center for Well-Being, including the Heroes for Health Fun Run, are just what is needed to help these kids.

So there I am, running next to my fiancée, a pediatrician who knows much more than I do about obesity in children and can run a lot farther too. I'm struggling not halfway through the race. My mind was so focused on the fear and difficulty of finishing the whole thing that I began to believe I couldn't do it. *My legs are tired,* I thought. A little while later I began to fixate on the pain in my hip. With every step I was that much closer to quitting.

Then something changed. I was passed in the race by a girl who was maybe 10 years old. At first I felt guilty that I couldn't even run as fast as a 10-year-old; but then I said to myself, *That's awesome. Look at her go. She is doing great.* That was followed by, *Hey! I'm doing it too. This is great. We are all out here doing something healthy for such a meaningful purpose.* My entire race turned around. I finished under 30 minutes, which was better than my goal. And, as the name suggested, that last half was indeed a Fun Run.

When I set out to write this piece, I began with the title "Fighting Chronic Disease." This is a sentiment often heard within the health care field. "She is battling with cancer," they say. "We can beat heart disease." "He is struggling with quitting smoking." All of these metaphors imply that there is a laboring effort against some kind of resistant force. Why does chronic disease have to be an enemy that is always pushing us back?

The term *cardiovascular diabesity* encompasses the disease process that more Americans, kids and adults, live with than any other. It includes coronary artery disease, hypertension, diabetes, obesity and high cholesterol. All of these problems stem from our lifestyle choices, such as the food we eat, the cigarettes we smoke, our activity or lack thereof, our sleep habits, and our stress levels.

In Dan Milman's *Way of the Peaceful Warrior,* the fictional Socrates says, "The secret of change is to focus all your energy not on fighting the old, but on building the new." At first in the Fun Run, I spent much of my time worrying about the old and the fact that I had never run such a long distance before. Once I focused on the reality that just attending the run was a success—simply being part of an event with the aim of helping more children be healthy—I was able to finish faster than I had hoped when I set out at the beginning.

I think that same secret applies to the people of Northern California who want to live healthier lives and the health professionals who are working with them to achieve this objective. If you work in the health care field, try not to take the easy way out by avoiding the conversation with your patient or client about living well. Don't wrestle against the disease. Instead, walk with them on their path and cheer them on with every healthy choice they make.

If you're the one making the change, don't focus on how hard it is going to be, how much extra work it takes to change your old behaviors. Rather think about the extraordinary improvements that can happen once you begin making different choices. It's not about beating cardiovascular diabesity. It's about building a new life full of joy, vitality and well-being. ◇

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Dr. Luckett, a family physician, is completing a fellowship in integrative medicine at the Sutter Santa Rosa Family Medicine Residency.

A slightly different version of this article appeared in the Northern California Center for Well-Being newsletter earlier this year.

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Public Health Epidemiology

Sarah Katz, MPH, Jamie Klinger, MA, Jenny Mercado, MPH, Lucinda Gardner, MSPH, Karen Holbrook, MD, MPH, Brian Vaughn, MPH

Epidemiologists play a key role in describing and investigating causes of disease in populations, identifying people who are at risk of disease, and determining how to control or stop the spread of disease.[1] At the Sonoma County Department of Health Services (DHS), epidemiologists engage in a broad range of activities, including public health surveillance and epidemiological investigation, communication, consultation, and program and policy evaluation. Their mission is to gather, analyze and interpret comprehensive and relevant health data on Sonoma County residents, and to use that data and information to reduce morbidity and mortality, achieve health equity, and improve quality of life for those residents.

DHS epidemiologists regularly analyze and report on vital statistics, communicable diseases, hospital, and socio-demographic data. They also examine population-based surveys, such as data from the California Health Interview Survey and the California Healthy Kids Survey. When local data are not available, epidemiologists develop or use existing data collection instruments to inform public health practice or assessment. Two recent examples of primary data collection are the Farmworker Health Survey[2] and the Assessment of Healthcare Access, Utilization, and Patient Experiences Among Sonoma County Adult Undocumented Immigrants and Their Children.[3]

DHS epidemiologists also collaborate with other agencies on a wide range of public health projects. For example, they are working with the DHS internal incident response team, local health partners, and Marin Sonoma Mosquito and Vector Control to support Zika preparedness and response efforts. Earlier this year, they provided technical assistance on the Sonoma County Community Health Needs Assessment, a joint project that involved DHS and most of the county's medical organizations. They also assist with the Hearts of Sonoma County hypertension control initiative and the Opioid Prescribing Guidelines Workgroup. These collaborative efforts have strengthened partnerships with the local medical community and have increased knowledge of the county's health and health care needs through data and information sharing.

Public health epidemiology is a rapidly evolving field. "Big data," changing health communication environments, growing expectation for "open data" and many other factors have expanded the epidemiologist's scope of work beyond traditional analysis of disease risk factors and general public health surveillance. Furthermore, advances in technology and information sciences—coupled with financial incentives for data reporting and new systems for storing and monitoring health care data—have led to the development of integrated health information systems, including growing adoption of electronic medical records. These changes afford great opportunities to epidemiologists, if appropriate methods for obtaining and making use of such data and information can be thoughtfully developed, tested and implemented.[4] For all these reasons, DHS epidemiologists are focusing on data and information sharing across sectors and organizations in Sonoma County, while at the same time meeting the ethical and legal obligations to safeguard all health information as required by law.

Data and information sharing can help increase business efficiencies, improve health outcomes, reduce health disparities and lower health care costs.

The authors work for the Sonoma County Department of Health Services. Ms. Katz is an epidemiologist and health program manager; Ms. Klinger, Ms. Mercado and Ms. Gardner are epidemiologists; Dr. Holbrook is the deputy public health officer; Mr. Vaughn directs the health policy, planning, and evaluation division.

One example of data sharing across organizations is Project Nightingale, a program funded by local hospitals, Partnership Health Plan and DHS. The project makes 24-hour respite beds available to unsheltered patients who are discharged from a hospital but have nowhere to recover. DHS epidemiologists are working with several partners to assess the effect of Project Nightingale on subsequent emergency department visits and hospital admissions.

This type of evaluation can only be conducted by coordinating and sharing data across health and social-service data systems that track hospital patients, the use of human and social services, and case management.

In July, DHS and local partners received funding to become an Accountable Community for Health (ACH). This initiative will help DHS create a more expansive, connected, coordinated and prevention-oriented local health system through partnerships with medical clinics, hospitals, nonprofits, schools and other agencies in Sonoma County.[5] As part of the initiative, DHS will use what it has learned from data sharing to improve health outcomes, create greater equity, reduce cardiovascular disease risk factors and lower costs related to cardiovascular disease, a leading cause of morbidity and mortality in Sonoma County.[6] DHS epidemiologists will work with community partners to support cross-sector sharing, analysis and reporting of valid data to inform clinical and community interventions, and to evaluate community efforts to improve cardiovascular health.

The demand for high-quality, cross-sector health data continues to grow in Sonoma County. As the field of public health epidemiology evolves, DHS epidemiologists will continue to identify risk and protective factors for disease and well-being through traditional epidemiological methods, and to take advantage of new and emerging data opportunities. DHS will integrate these new sources of information and knowledge into effective interventions in partnership with the many residents, organizations and policymakers who work so diligently to improve and protect individual and public health in Sonoma County. ◇

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Collaborating with referring professionals, Bob Casanova, Psy.D. is a nationally respected educational consultant who specializes in providing recommendations for students with special needs of an emotional, behavioral or psychological nature.

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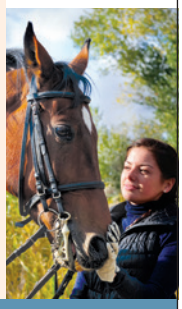

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Last Cries of Kalaupapa

T.W. Hard, MD

Father Damien's grave on Kalaupapa *(photo: T.W. Hard).*

i.

Gentlemen, it's the microbes who will have the last word.

—Louis Pasteur

THE EPIDEMIC STARTED in typical fashion. Except for a time factor of months, instead of days, the sharp upward slope of beginning cases could have been ebola, Zika or smallpox. There were a few isolated patients at first, not enough to arouse the suspicion of local physicians or the health department. For the next several decades, the disease—thought to originate with Chinese immigrants—spread insidiously and quietly. Although the infection was disfiguring, deaths were rare. Often the first symptoms were little more than a small sore or patch of numbness, hardly enough to cause concern.

As the number of infected people increased, the medical director of a local hospital urgently requested the Board of Health "to devise some efficient and humane measure by which the isolation of those affected can be accomplished."[1] Ultimately, the Minister of the Interior issued the following proclamation:

> Whereas the disease has spread to considerable extent among the people and the spread thereof has excited well-founded alarm . . . the Board of Health, and its agents, are hereby empowered to assist in removing such persons to a place of isolation . . . for all patients considered infected or capable of spreading the disease.[1]

The date was 1865; the location, Hawaii; the disease, leprosy.

ii.

And this was his kingdom, a flower-throttled gorge with beetling cliffs and crags on which floated the blattings of wild goats.

—Jack London,

"Koolau, the Leper" (1913)

We are flying westward from Maui at an altitude of one thousand feet. The Pailolo Channel spreads below in a vast undulating blueness. Our transportation

Dr. Hard is an emergency physician at Petaluma Valley Hospital.

Kalaupapa Peninsula *(photo: T.W. Hard).*

is a specially fitted helicopter with a plastic canopy for maximum viewing. Behind the controls is an ex-military pilot, fresh from a tour in Afghanistan. My wife and I are in the backseat, eyes pressed to the windows. Postcard images surround us in every direction.

Ahead, tall green mountains rise abruptly from the Pacific. Scattered rain clouds cloak the upper peaks. Far to the west, a rainbow arcs through the mist. Our destination is Kalaupapa, a remote peninsula on the island of Moloka'i.

For more than a century, victims of leprosy were identified, quarantined and herded to Kalaupapa to die. Since there was no cure for the disease, the peninsula was a one-way stop. Children were ripped from their families; mothers carried off; fathers captured at gunpoint and marched to the piers. A few defiant individuals refused to comply. When a bounty was placed on their heads, they were hunted down.

I have wanted to visit Kalaupapa for many years. I was a resident at Queen's Hospital in Hawaii once, and a relative of Queen Kapiolani was a patient of mine. By the time I started my internship, a cure for leprosy had already been discovered; yet even then the locals were reluctant to speak about the stigmatized disease. If you were Hawaiian and had a relative taken to Kalaupapa, you buried it in your past. Names of quarantined patients were erased from the family tree. It was as if an infected family member never existed.

As we cruise along the north edge of Moloka'i, we pass over a tall, razor-sharp ridge. Abruptly, our vista opens into one of the most spectacular views of the Pacific. Carpeted green cliffs rise two thousand feet above the ocean. Guidebooks call these the tallest sea cliffs in the world. Here and there, a waterfall cascades downward in a thin filament of spray. Below us, a half-dozen sea birds glide. The white birds, the blue ocean and the covered green ridges compose a scene of breathtaking beauty.

We pass a lovely valley, a deep cleft cut sharply into the mountains. There comes another and then a third. The valleys are isolated and remote. A few Hawaiians lived here once, but the valleys were not easily reached and existence then, even for these native peoples, was difficult. Here the winter storms were fierce and the summer sun merciless. There was no outward passage except by sea.

Ahead looms the peninsula of Kalaupapa, a six-mile tongue of land flowing outward from the striking cliffs. The setting is perfect for a penal colony. The nearly impassable cliffs guard the southern end of the peninsula, and the ocean blocks all other escapes. A single narrow path winds up through the cliffs, but the trail is easily guarded. If you were dumped here, as the early patients were, there was no way out.

As we approach the landing strip in the comfort of our helicopter, I wonder what it must have been like for those first unfortunate people who were quarantined here. Starting in 1866, they came by the boatload every few months. By the end of the first year more than 100 patients had arrived. By the end of the tenth year, the population had grown to 800.

The ship captains were deathly afraid

of the disease. To go ashore risked the possibility of exposure. Sometimes patients were rowed onto a rocky beach. At other times, when the seas were rough or the weather inhospitable, they were shoved overboard. Those who were too sick to swim surely drowned. Those who made it to shore had to fend for themselves.

In the beginning, there was no shelter, no food, no blankets, no place of refuge. After all, these were "Hawaiians," the authorities claimed. These were people used to living off the land.

After landing, we watch our helicopter head back to Maui along the steep cliffs; then we walk toward the tiny terminal and wait for others who make up the morning tour. Some are flying in by prop plane from Oahu. A few have hiked down the cliff trail, which is billed as "3.6 miles and 26 switchbacks."

Inside the terminal we are greeted by a sign: "Welcome to Kalaupapa." There was a different message once. Long before helicopters and runways, early patients carved a greeting reminiscent of Dante's *Inferno:* "Enter all you, who abandon hope."

iii.

And the leper in whom the plague is, his clothes shall be rent, and his head bare, and he shall put a covering upon his upper lip, and shall cry, Unclean, unclean.

—Leviticus, 13:45

In recent times, there has been much effort to rebrand the infection caused by *M. leprae* after the bacterium's discoverer, the Norwegian physician Gerhard Hansen. Yet, despite the cure of modern antibiotics, the word *leprosy* still connotes horror and repulsion.

The initial symptoms of Hansen's disease often depend on host immunity and may involve a progression of disfiguring sores along the face, nose and ears. A loss of movement of the eyelids leads to eventual blindness. The disease also attacks nerve endings in the hands and feet, and with the ensuing numbness come injuries and infections, resulting in the ultimate loss of fingers and toes. The incubation of *M. leprae* may range over a number of years. Spread is thought to be through repeated exposure to respiratory droplets or recurrent skin contacts.

M. leprae defies Koch's postulates for identifying causative agents of infectious disease. It has yet to be grown in culture, and transfer of the mycobacterium to research animals seems to be limited to the footpads of mice. Armadillos are the only animals suspected of carrying the disease.[2]

Father Damien shortly before his death in 1889 *(photo: William Brigham).*

Recent DNA mapping has done much to identify the molecular composition of *M. leprae*. Genetic typing suggests that as many as a quarter of the population of Northern Europe may have been exposed to Hansen's disease by the 10th century. From these studies, it has been postulated that most Europeans have developed a 95% immunity.[3] The Hawaiians, of course, had no such natural protection. As with smallpox, cholera, tuberculosis and syphilis, the *M. leprae* infection brought to Hawaii by outsiders spread through the native population with disastrous results.

When patients began arriving in Kalaupapa in 1866, the causes of leprosy were unknown, and there was no treatment. Some physicians speculated that leprosy was the fourth stage of syphilis. Immoral living, poor sanitary conditions, even hereditary components were considered sources of the infection.

During the first several years of the Kalaupapa colony, the conditions were primitive. Patients cast ashore had to make their way inland. Some of the survivors lived in caves. Others erected flimsy stick huts that blew away in storms. There was no running water; the nearest stream was in the mountains two miles away. It was an easy distance, if you were fit, but early patients were often crippled and could not walk. Others could not use their fingers to carry containers or bowls. The inhabitants had few blankets and clothes. Infected children, orphaned from their families, were often forced to work as slaves.

Such was the setting in 1873 when the Catholic Church recognized a need for order and civility. The conditions were so deplorable that the church asked volunteers to stay for only a limited period of time, promising they could rotate out if circumstances became intolerable. The first to enlist was a 33-year-old Belgian priest named Damien De Veuster. During his first weeks in the colony, he slept under a tree. One hundred and thirty six years later, Father Damien was canonized as a saint.

iv.

He was a coarse, dirty man, headstrong and bigoted . . . and his relation with women and the leprosy by which he died should be attributed to his vice and carelessness.

—Rev. C.M. Hyde

So wrote a Honolulu pastor to his San Francisco colleague Rev. H.B. Gage in 1889 to discredit Damien's fame. Gage

subsequently published the letter in *The Presbyterian* newspaper, where it garnered nationwide controversy. In Damien's defense, Robert Louis Stevenson published a scathing open letter to Hyde in 1890 that remains one of the fiercest rebuttals in literature. "Your letter," wrote Stevenson, "is a document which, in my sight, if you had filled me with bread when I was starving, if you had sat up to nurse my father when he lay a-dying, would yet absolve me from the bonds of gratitude."[3]

Father Damien came to Kalaupapa in 1873, eight years after the beginning of the Hawaiian Quarantine. At the time of his arrival there was no law, little shelter and no social order. Women were assaulted, the weak were robbed, and days were often spent in drunkenness and debauchery. Damien, in a kind and persuasive way, brought decency and religion to the colony. He tried to abolish alcohol and encouraged respect for women and children. He procured blankets, clothes and construction materials from the government. Over the next decade he built several churches, a dormitory, a reservoir, an aqueduct system and many homes for the inhabitants.

He was known as a tireless worker and a strong advocate for his patients. "We lepers," he liked to say. He remained in Kalaupapa for the last 16 years of his life, eventually catching leprosy and dying from it.

v.

I have seen the bad effect of forcible separation of the married companions. It gives them compression of the mind, which in some cases is more unbearable than the pain and agony of the disease itself . . .

—Father Damien (1886)

There are 12 adults on our tour, but no children: the colony does not permit guests under 16 years old. Some on the tour have been to Kalaupapa before. It is a very special place, they tell us. There is a spiritual sense of beauty here.

We climb into a yellow school bus that looks like a relic from the 1940s. Our guide is an athletic woman dressed in khaki shorts and hiking boots. She has climbed down the 3.6-mile cliff trail every week for the past decade, but this is her last month of work. In the days to come, she reports, the National Park Service will be taking over the tours. There are many changes planned, and she worries about what the future will bring. As the old bus creeps along a paved road, we feel as if we are carried back in time.

Our first encounter with the past is a grass strip next to the road with hundreds of graves. Some are marked by simple white crosses, others by concrete blocks. Most of these memorials are from the early 1900s, decades after Father Damien arrived.

I think back to historical accounts I've read about various patients brought to Kalaupapa with early signs of leprosy. One account tells of a young man with a degree in economics. His future was cut short when he discovered a red sore on his arm. In another case, a lovely Hawaiian woman in her twenties with a beautiful voice and a successful musical career was shipped to Kalaupapa after physicians noted a numb patch on her leg. Although most patients quarantined on the peninsula were Hawaiian, I remember the photo of a young Caucasian father surrounded by four daughters he was forced to leave.

I wonder if the graves of these patients are here; and I wonder about thousands of other patients imprisoned on the colony. How could they survive? How could they go on living, knowing the horrible trajectory of their lives?

Our guide tells us that 8,000 people died here over the years. Sadly, there are only 1,500 graves. At first, the burials were in small, shallow, unmarked pits. The soil was hard to dig, and often the graves were uprooted and desecrated by the domesticated pigs.

We travel into the small government settlement. Many simple, wooden buildings have been preserved as they initially stood. Social outcry, pleas from quarantined patients and a visit by Queen Kapiolani in 1884 placed significant pressure on the Hawaiian government to construct reasonable facilities for the colony. A small hospital, a bookstore, an administration building and a warehouse next to a concrete pier remain standing. These late 19th century improvements persist with little change.

We visit a church and the gravesite of Mother Marianne Cope, who arrived in 1888 with six other nuns, several months before Damien died. Along with Damien, she did much to improve conditions for the patients. The nuns were especially helpful for young girls, who were often the most vulnerable to the disease. Mother Marianne founded a dormitory that housed more than 100 orphaned girls by 1893. Despite their intimate work, none of the nuns ever developed Hansen's disease. Mother Marianne was canonized in 2012.

vi.

Father Damien stepped ashore from the boat. He had his left foot bandaged. Naturally, I asked the father how he had hurt his foot. And came the prompt answer: "I put my foot into the water. I did not feel the heat." Then he added with a touch of irony, "I think I have the disease."

—Ambrose Hutchinson,
Kalaupapa patient (1878)[5]

We are standing next to the grave of Father Damien. A thin iron fence surrounds the site, which is marked by a tall marble cross. The memorial rests next to the first church Damien built. We are told his body was returned to Belgium in 1933 but several fragments of his remains still reside here. Someone has hung a group of flowered leis on the fencing. The bright yellow petals have faded, and the old pandanus tree that provided shade and shelter for the first part of Damien's stay is long gone.

Even after much research on Kalaupapa, the story of the leper colony is still hard to fathom. What is clear is that Damien came to this isolated peninsula and devoted his life to the betterment of its unfortunate inhabitants. The church he built stands, as does the reservoir, providing water with which he could bathe and cleanse the wounds.

We will be departing soon, riding our helicopter back to a comfortable hotel on Maui. We will leave this place to a far different world than those first

St. Philomena, the first church built by Father Damien *(photo: T.W. Hard).*

few inhabitants found. As I gaze across the magnificent green cliffs and the ocean rolling toward the rocky shore, what is most impressive is the silence. But it is a silence to the ear, and not the soul.

If you close your eyes and stand quietly, you can still hear faint voices in the wind; the cries reverberate across the cliffs from patients once imprisoned here. They are sounds of sorrow and separation and despair.

On the walls inside one of the buildings, photographs depict the facial disfigurement of patients before and after the discovery of the antibiotic dapsone in 1946. In each instance the recovery is remarkable. The disease was arrested, the sores improved, the infection no longer contagious. Eventually, *M. leprae* became resistant to the antibiotic, so triple therapy (dapsone, rifampin, and clofazimine) is now used.

In 1965, one hundred years after it began, the quarantine on Kalaupapa was finally lifted. Families could come and go as they pleased. Some of the patients left. A few traveled around the world to see places they had missed. Others stayed. For many, it was the only home they had ever known.

At the time of this writing, there are still a handful of patients living on the peninsula. Most are in their seventies. When they die, this dark chapter in Hawaiian history will close.

The government plans to create a special memorial soon. There is talk about erecting a circular structure with a large granite wall containing the chiseled names of all 8,000 patients who were quarantined here. The memorial is planned for a grassy space thought to contain 2,000 unmarked graves.

As we fly out of the peninsula and turn east, I look back and find the narrow lava beach, the rise of land, the faded white church that Damien built. In my imagination, I can see a small dark figure dressed in a cassock and a black-brimmed hat, hurrying along the path, stopping here and there to help sick patients lying on the ground. He pauses once, stands up, and gazes in our direction. Did he know? Did he realize what relief of suffering he would bring? The sun strikes his back, and his shadow drifts halfway across the world.

Perhaps in this one instance Louis Pasteur was wrong. Perhaps humankind, through kindness and love, invention and science—not microbes—will have the last word. ◇

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Anti-VEGF Treatment for Exudative Macular Degeneration

Shalini Yalamanchi, MD, Stephen Meffert, MD

Age-related macular degeneration (AMD) is the leading cause of severe irreversible vision loss in adults worldwide over the age of 60.[1] The disease escalates with age and affects 14–24% of American adults aged 65–74; 35–40% of those aged 75–84; and nearly 50% of those 85 and older.[2–4] AMD is a progressive and chronic disease that involves deterioration of the macula, which is located in the retina and is responsible for high-resolution central vision. The macula is 5.5 mm in diameter and contains the largest concentration of color-sensitive photoreceptors (cones) in the eye. Loss of macular function can produce central visual field symptoms that interfere with the ability to read, recognize faces and drive.

AMD occurs in non-exudative (dry) or exudative (wet) forms. Non-exudative AMD is slowly progressive and characterized by drusen, pigmentary changes and retinal atrophy (Figure 1). Variable amounts of vision loss occur in non-exudative AMD.

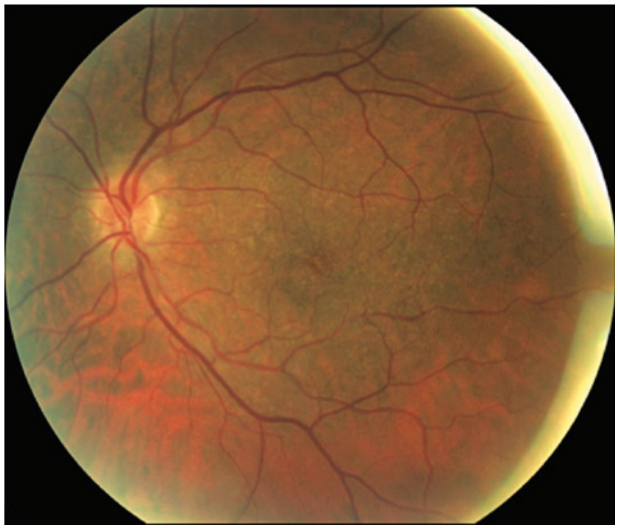

Figure 1. Color fundus photograph of the left eye. Non-exudative AMD with drusen, pigmentary mottling and mild atrophic changes.

Figure 2. Color fundus photograph of the right eye. Exudative AMD with choroidal neovascularization, subretinal hemorrhage and subretinal fluid.

Exudative AMD is characterized by choroidal neovascularization, in which abnormal blood vessels from the choroid grow into the subretinal space. These vessels are fragile and ultimately leak blood, fluid and lipid, which can lead to acute symptoms of distortion and central vision loss (Figure 2). Progressive growth of this neovascular network can lead to macular scarring, cell damage and permanent vision loss.

Before 2004, patients diagnosed with exudative AMD could anticipate near-certain vision loss. Treatments at that time were only able to slow the progress of the disease and not reverse its impact on visual function. In 2004, the approach to exudative AMD changed when the disease's pathogenesis was linked to an overexpression of vascular endothelial growth factor (VEGF). The upregulation

Dr. Yalamanchi and Dr. Meffert are Santa Rosa retinal specialists.

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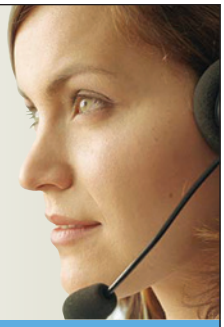

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of VEGF in exudative AMD begins a series of events: (1) binding of VEGF to VEGF receptors on endothelial cells, (2) endothelial cell activation, (3) production of cytokines that increase vascular permeability and lead to proliferation and migration of endothelial cells, (4) formation of vascular buds and then tubules that develop into vessels with the growth of surrounding pericytes. Inhibiting the effects of VEGF on this process stabilizes both choroidal neovascularization and visual acuity; it can also lead to improvement in vision by reducing vascular permeability, macular fluid and subretinal hemorrhage.

The advent of intravitreal anti-VEGF injections revolutionized the treatment of exudative AMD. These treatments have resulted in preservation as well as improvement in vision and quality of life.

The first anti-VEGF drug to be approved by the FDA for treating exudative AMD was pegaptanib sodium (Macugen), which is a selective inhibitor of the VEGF-165 protein. Although the effect of pegaptanib sodium on vision was only modest, it helped confirm the role of VEGF in the pathogenesis of exudative AMD and opened the door for the greater success of other anti-VEGF agents. Currently, bevacizumab (Avastin), ranibizumab (Lucentis) and aflibercept (Eylea) are used as first-line therapy to treat exudative AMD. All three of these drugs are pan-VEGF-A blockers and have been shown in several clinical trials to stabilize choroidal neovascularization and vision.

The FDA has approved ranibizumab and aflibercept for treating exudative AMD. Bevacizumab is approved for treating colon cancer, but the drug is used "off label" to treat exudative AMD due to similar efficacy and a distinct pricing advantage ($50 per injection). The pricing is higher for ranibizumab ($2,000 per injection) and aflibercept ($1,800 per injection), which reflects the FDA approval process. All three drugs are covered by Medicare, but the terms of coverage can often be complex.

Several large-scale prospective studies on patients with exudative AMD have examined the efficacy of ranibizumab, aflibercept and bevacizumab. The MARINA and ANCHOR trials demonstrated that 90% of patients treated with monthly ranibizumab lost less vision over two years, and that treatment was significantly superior to prior standard-of-care options, including observation or photodynamic therapy.[5–7] The CATT and IVAN studies demonstrated comparable efficacy and equivalent visual outcomes for bevacizumab vs. ranibizumab with monthly dosing.[8,9] More recently, the VIEW studies showed that outcomes with aflibercept dosed every two months were clinically equivalent to monthly ranibizumab.[10] Although clinical data from these trials supports anti-VEGF therapy for exudative AMD, the ideal drug choice has not been established, and treatment is often tailored to the individual patient in regards to efficacy, safety and cost. Despite the high cost of the on-label medications, even ranibizumab (more expensive and shorter-acting than aflibercept) has been found to be cost-effective in terms of quality adjusted life years.[11] This benefit is due both to the importance of vision and the efficacy of the treatment.

Anti-VEGF injections are completed in the office as an outpatient procedure. Before the procedure, anesthetic drops, pledgets and/or a subconjunctival lidocaine injection are used to numb the eye. A speculum may be used to hold the eyelids open and a povidone-iodine swab is frequently applied over the injection site. The anti-VEGF drugs are injected directly into the vitreous.

Once inside the eye, the medication diffuses throughout the retina and choroid and binds to the abnormal VEGF proteins, preventing further blood vessel growth and leakage. Patients describe minimal discomfort with the procedure and are advised that they may see floaters immediately after the treatment for the next 1–3 days.

The risks for ocular complications following intravitreal anti-VEGF

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injections are low. They include endophthalmitis, non-infectious inflammation to the biologic anti-VEGF agent, retinal tear, retinal detachment, subconjunctival hemorrhage, vitreous hemorrhage, elevated intraocular pressure and traumatic cataract.[12–14] The clinical trials mentioned above have not established statistically significant evidence for a greater risk of arterial thromboembolic events for patients in anti-VEGF cohorts compared with those in control groups. Further studies are needed to better understand the potential effects of systemic VEGF inhibition.

Anti-VEGF treatment often begins with monthly intravitreal injections until the macular fluid and/or subretinal hemorrhage resolve, which is determined by optical coherence tomography imaging and fundus examination.

If the exudative features do not continue to improve after two to four monthly treatments, switching to another anti-VEGF agent is common. Complete resolution of exudation may not be possible for all patients, and long-term monthly treatments may be required to help maintain stability and lower the risk of further structural damage. In cases when treatment has successfully controlled neovascular activity, the injection protocols can be tailored to the individual. Treatment regimens include treat and extend (TAE) or treat as needed (PRN).

About three-fourths of retina specialists in the United States treat exudative AMD with the TAE regimen.[15] Once inactive disease is achieved with monthly treatment, the treatment interval is gradually extended by one to two weeks up to a maximum of 12 weeks. If disease recurs, the interval is shortened and an optimal frequency of treatment is determined to maintain disease stability.

With PRN treatment, patients are closely monitored every 4–6 weeks, and treatment occurs only with recurrence of exudative activity. PRN can increase the number of office visits and may allow for multiple recurrences before retreatment, possibly leading to disease progression and vision loss. Some patients opt for PRN because they prefer to avoid treatment when the disease is inactive. There is currently no clinical data to compare TAE and PRN approaches, but two studies have demonstrated improved visual outcomes and reduction in the number of injections and office visits from TAE regimens.[16,17] Nonetheless, debates continue regarding maintenance treatment protocols for exudative AMD.

Exudative AMD is a chronic process, and treatment is often required indefinitely. Although anti-VEGF therapies are efficacious in stabilizing AMD and optimizing visual outcomes, it is important to discuss with patients that anti-VEGF treatment is unable to cure the disease or reverse macular structural damage. For this reason,

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Flamingo Conference Resort & Spa

24th Annual
LATINO HEALTH FORUM

RACISM AND DISCRIMINATION: IMPACTS ON HEALTH

The LATINO HEALTH FORUM is Northern California's premier health education forum. Our goals are:

- To inform professionals about the most relevant challenges facing the Latino population in Sonoma County
- To enhance access & quality of health services for Latinos & the community at large
- To inspire local students to pursue careers in health & social services
- To facilitate networking among healthcare and other service providers
- To raise awareness of racism and discrimination in Sonoma County
- To acknowledge personal racism and prejudice

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vision loss may continue to occur in patients undergoing regular treatment for AMD. It is also important to educate patients on modifiable risk factors for AMD, such as smoking, AREDS 2 vitamin supplementation, changes in diet, monitoring of visual symptoms and routine evaluations to monitor both eyes.

Significantly increased understanding of exudative activity over the past decade has translated into successful treatment regimens with anti-VEGF therapy. Future studies will help guide the use of anti-VEGF treatment in the long term and ideally lead to new therapies to prevent AMD progression. ◇

Email: nbcvard@ubvscr.com

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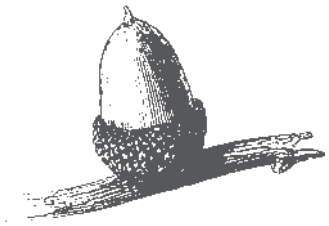

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The evening begins with a social hour at 6 p.m., followed by dinner and the awards presentation.
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Please indicate dinner choice.

Donations made to the Holiday Greeting Card benefit the SCMA & SCMA Alliance Health Careers Scholarship Fund. Become a donor for this year's greeting card at www.scmaa.org by Dec. 8, 2016.

Empowering Lives One Computer at a Time

Laura Robertson

Born in California in 1994, Jeramy Lowther Jr. bounced from state to state with his single mother, finally landing in Toledo, Ohio, where he discovered that growing up without a father in the picture was rough. At 14 he moved back to Sonoma County to reunite with his father, with unfortunate results. Between his father's issues and troubles of his own, Jeramy found himself with no stable home, no parental support and no success at school. He became homeless and entered foster care at 16.

With guidance from the VOICES Youth Center in Santa Rosa and the Valley of the Moon Children's Home, Jeramy eventually enrolled at the Hanna Boys Center in Sonoma, a residential treatment center with an onsite high school. This event was a turning point for him. "Hanna is definitely the place that I can thank the most," he says. "They taught me basic life skills and all the things I needed to know at my age. I started the summer before my senior year with beginning sophomore credits and was able to graduate on time with a 3.14 GPA and a couple of scholarships too. I couldn't have done it without them."

Ms. Robertson chairs the Give-a-Gift program for the SCMAAF.

Jeramy Lowther Jr. with laptop computer from Give-a-Gift.

Jeramy made more than one attempt to attend Santa Rosa Junior College, but he soon learned that taking classes without accepting necessary help was not enough to achieve success. He left SRJC, secured a safe a place to live at Tamayo Village and accepted an intern position at VOICES Youth Center. "At VOICES," he recalls, "I saw a lot of services that people were able to get for going into school. I knew for sure that I was determined to go back into school no matter how hard it was going to be." Thanks to the Independent Living Program run through VOICES, Jeramy learned about the Give-a-Gift program, which donates laptop computers to foster youth. "This was the nudge I needed," recalls Jeramy, who received a laptop computer from Give-a-Gift earlier this year.

Jeremy re-enrolled at SRJC, only to discover that his homework for math class had to be completed online and that the computers in the tutorial centers were often taken. He found that owning his own computer was vital to completing this class, and to his continuing success.

The mission statement of the Sonoma County Medical Society Alliance Foundation reads, "We are physician families committed to creating a healthier Sonoma County by improving the lives of those in need." SCMAAF's Give-a-Gift Program has been improving the lives of foster children in our community for more than 60 years. The program's impact is twofold: it provides holiday gifts to meet the specific needs of youth in foster care, and it offers laptop computers to young adults who are pursuing higher education.

Removed from their homes due to abuse or neglect, foster youth often bounce from placement to placement, and they are likely to fall behind academically. Furthermore, between the ages of 18–21, foster youth "age out"

of California's child welfare system, meaning that they are "emancipated" without any funding. Many of them never reunite with their families, so if they do reach college, it is often without parental support or long-lasting connections. Without housing, education or emotional support, their future is challenging.

By continuing their education past high school, foster youth have the best chance of success—and laptop computers are essential tools for that success. Give-a-Gift began donating computers to local foster youth in 2007 and, with the help of its generous donor base, has since donated 15–25 computers per year. This year set a the high-water mark for donations: thirty laptops were awarded to youth attending Santa Rosa Junior College, Sonoma State University and several other schools in Northern California. To make these contributions go even further, the Give-a-Gift committee has partnered with Best Buy, which supports our foster youth by discounting computers, warranties and ongoing technical support. This year, the company also donated computer cases for all the students.

Give-a-Gift collaborates directly with the VOICES Youth Center and SRJC to identify students with the most need. VOICES (Voice our independent choices for emancipation support) is a community resource center where foster youth can access services to meet their health, wellness, employment, education and housing needs. VOICES Director Amber Twitchell observes, "Often these youth have been taught that they are worthless and that no one cares whether they succeed or fail. This program [Give-a-Gift] shows foster youth that there is a group of committed, passionate people that believe they can achieve their dreams and create a healthy life for themselves and their future children."

While Jeramy's initial SRJC plan was to become a mechanical engineer—he thought he would build his own robot or smart house—his focus has changed. During an internship at Sonoma Ecology Center, Jeramy developed a love of the environment. "I'm going for environmental science but want to get experience in mechanics as well," he explains. "I want to know I can leave a mark on the world by creating a message of sustainability."

Jeramy's journey has had many hurdles and he's experienced numerous setbacks, but he's outgoing, focused, caring and very willing to share his story. His commitment to a positive outlook has helped him excel in many ways.

Jeremy's success doesn't have to be unique. Empowering more foster youth to fulfill goals like his is achievable, but it requires money. Give-a-Gift is fundraising right now, and your contribution can help students like Jeramy get the laptop computers they need for success.

To donate, or to find out more about Give-a-Gift, visit scmaa.org. ◇

Email: giveagift@scmaa.org

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To encourage physician collegiality and the advancement of community health, PASSPORT TO PARTICIPATION acknowledges Sonoma County physicians' active engagement with SCMA, CMA and community activities by awarding points for participation.

For each participation point, your name is entered into a drawing for a chance to win an iPad. The winner will be drawn at SCMA's Wine & Cheese Reception in May 2017. This year's iPad winner was Dr. Rick Flinders.

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- Be elected to the board of directors or CMA delegation.
- Serve on an SCMA or CMA committee, or be a legislative advocate.
- Communicate with a legislator about a health-related issue.
- Participate in surveys or vote in the annual election.
- Nominate a colleague for a physician award.
- Attend SCMA dinner and receptions, CMA Leadership Academy or House of Delegates.
- Volunteer your medical services at free clinics or health fairs.
- Notify SCMA of any engagement with SCMA, CMA and/or community activity. *(Submit brief description, date, number of hours, and location to SCMA.)*

For more details, contact Rachel Pandolfi at rachel@scma.org or 707-525-4375.

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September 2016

Boo Radley, Block Parties and World Peace

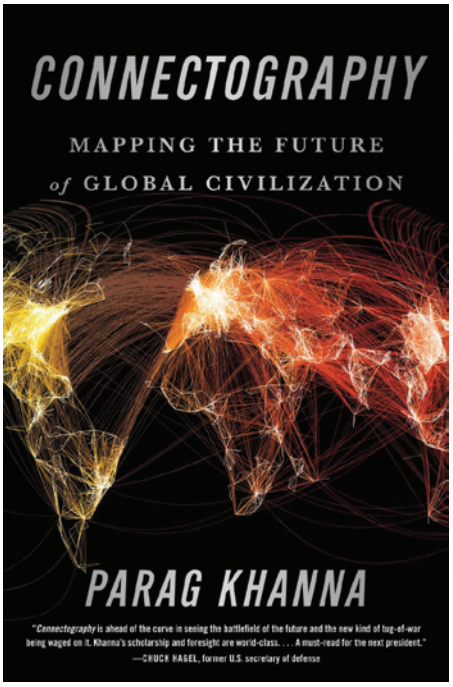
Brien A. Seeley, MD

Connectography: Mapping the Future of Global Civilization, Parag Khanna, Random House, 496 pages (2016).

The absent are always in the wrong.
—English proverb

Call him Mr. Miller. Like Boo Radley in *To Kill A Mockingbird,* he was our neighborhood's reclusive boogeyman. As kids in the early 1950s, we one-upped each other's scary tales about how the raging Mr. Miller might suddenly burst out of his side door to chase any kid who dared to take the shortcut across his scruffy unmowed lawn. When we played in the street, fetching the errant ball from his yard made the hair stand up on the back of our necks. Some said that he was always in there lurking, ever watching from behind his dark windows. Some said he collected swords and spears. He never had visitors. Mom said that was because he "probably has something wrong with him." He rarely came outside, but when he did, he always wore a dark suit, like an undertaker, and would rush to get in his car and drive off into the night.

For years, the spooky Mr. Miller was ostracized, and his overgrown hermitage was off-limits to all the peace-loving


CONNECTOGRAPHY
MAPPING THE FUTURE
of GLOBAL CIVILIZATION
PARAG KHANNA
"Connectography is ahead of the curve in seeing the battlefield of the future and the new kind of tug-of-war being waged on it. Khanna's scholarship and foresight are world-class. . . . A must-read for the next president."
—CHUCK HAGEL, former U.S. secretary of defense

postwar families living on our street in Manhattan Beach, a Los Angeles suburb. Our neighborhood was doubly cursed—Mr. Miller with isolation, and the neighbors with ongoing fear of the "unknown other"—until that fateful Saturday, 1956, at our annual St. Patrick's Day potluck block party.

We were shocked to see Mr. Miller show up. Who had invited him? He wore a dark suit and tie and was accompanied by a cheerful woman named Tarja. He was smiling and pleasant to everyone, and we kids finally got to see him up close. He had brought Rumaki (bacon-wrapped water chestnuts), a treat that he had discovered while stationed in the South Pacific during the war. In a gentle Irish brogue, he regaled everyone with his life story. He had lived in England, but his wife had been killed during the Blitz and in his grief he left for the U.S., where he enlisted right after Pearl Harbor. He was seriously wounded in the Solomon Islands and was sent home. After the war, he was mired for several years in lonely depression, but he found a rebirth by taking up ballroom dancing at the Aragon Ballroom in Santa Monica. There, he met Tarja, who was from Finland and loved to dance. Our mythic boogeyman had co-founded the Aragon Dance Studio, where he usually worked until 2 a.m. Consequently, he had to sleep past noon on most days.

From that day forward, Mr. Miller and his Rumaki were always welcomed at the block parties. He told us kids we could take the shortcut through his yard any day, as long as we were quiet. He even hired my big brother Mark to mow his lawn. Several neighbors enrolled at his dance studio. A new age of harmony, peace and prosperity came to our block.

The revival of Mr. Miller and the rejuvenation of our neighborhood is a fitting allegory for *Connectography,* Parag Khanna's book about new ways to create world peace, harmony and prosperity. Khanna suggests that international "bloc parties" could build prosperous new trade groups like the EU that could peacefully unite all of the Americas or all of Asia in new, win-win relationships. To ensure peace, such blocs would need to include rogue

Dr. Seeley, a Santa Rosa ophthalmologist, serves on the SCMA Editorial Board.

nations such as Cuba and North Korea that, like Mr. Miller, are mistrusted. This new paradigm would replace nationalistic geopolitics with blocs made of networked "nodes" that could be city states, mega-regions or small nations. These blocs, Khanna claims, would evolve efficient, shared, interdependent supply chains that would transcend sovereign borders. By being intricately connected in trade, transportation and culture with both their own member states and the other major blocs, the blocs would be motivated to settle differences peacefully.

Khanna supports his views with examples that are enlivened by his astute explanation of the principle each one embodies. Some of these principles are familiar from the saga of Mr. Miller: Sanctions cause nations to find partners elsewhere (like Tarja); trade with far-off places brings new culture and products (like Rumaki); trust in neighbors opens new opportunities (like shortcuts, jobs and dance classes).

Khanna refers to this connectivity as a "supply chain world."

> [A] supply chain world is a post-ideological landscape. Russia no longer exports communism; America scarcely proffers democracy; China has abandoned Maoism for hyper-capitalist consumerism. From Africa to Asia—the lion's share of the world's population—it's all business, all the time.

He sees large investment by both nations and multinational corporations in infrastructure connections and the resulting supply chains as a tide that will raise all boats. He goes on to predict that the resulting relationships and prosperity will likely make future wars an untenable option and will produce the growth in productivity, education, and sustainability that will be needed on a planet with nearly 8 billion people. Investors, nations and corporations will continue to be the main winners: the 1%. But Khanna sees the 99% as having a new and powerful borderless proletarian leverage in being able to disrupt crucial supply chains rather than protesting to gridlocked governments. He says the World Trade Organization and new supply chain governance entities, such as the Extractive Industries Transparency Initiative, will also help implement environmentally mindful management of the extraction of shared resources, a control that is essential to avoiding a tragedy of the commons.

Attempting to isolate any nation—whether by sanctions, embargos or blockades—has proven to be largely futile and unwise, says Khanna. He explains how Russia, Iran and North Korea have all made effective end-runs around the sanctions enacted against them. History has repeatedly shown that seeking security or exclusive privilege behind a fortress wall actually cements that place as one to be resented, climbed over (the Alamo), tunneled under (Gaza Strip), torn down (Berlin) or placed under siege (Troy). Those who hide behind walls become the most vulnerable to siege.

In today's world, secrets are hard to keep, says Khanna. Ubiquitous satellite imagery, video surveillance, social networks and the internet act like ever-vigilant "eyes on the street." Intelligence, shipping and trade networks furnish nearly instantaneous tracking of where natural resources are going. These new forms of connectivity help stabilize world peace. The flow of oil resources and its price, for example, is tracked daily if not hourly. Strategies such as the radio silence used by the Japanese fleet in its surprise attack on Pearl Harbor are now anachronistic. Today the immediate detection of expansionist aggression enables prompt countering moves that render such aggression futile. As modern nations increasingly recognize that locally produced renewable energy can replace their addiction to imported fossil fuel, the likelihood of resource wars diminishes, according to Khanna.

To impute evil intent from the unknown other encourages military build-ups and the building of walls rather than productive connections, says Khanna. Vilifying the unknown other is the strategy that empowers despots and that impels people to act in fear or anger rather than with wisdom. In contrast, connecting with the unknown other, such as Mr. Miller, can result in mutually beneficial trade and help ensure peace and prosperity.

Connectography is America-centric in its outlook, and it holds up a mirror to U.S. policymakers:

> America is increasingly divided between its key global nodes and its Rust Belt backwaters. Already it is inaccurate to think of America as "united" when in fact Americans belong—or don't belong—to vastly different global supply chain circuits. The divides are not just red state versus blue state but urban versus rural. Voter preferences align much more according to professional circuits—factory worker, teacher management consultant, banker, farmer—than to geography.

Khanna goes on to quote urban expert Richard Longworth:

> Midwestern states make no sense as units of government because, for example, Kansas and Missouri battle to get companies to relocate across State Line Road rather than uniting against global competition.

Making large investments in both domestic and foreign infrastructure in the form of highways, bridges, tunnels, canals, pipelines, container seaports and rail lines is the author's recommended strategy for modern nations. Such "checkbook diplomacy," Khanna repeatedly points out, is how China is rapidly establishing access to resources in Africa, South Asia, South America, Russia and Eastern Europe. Exporting construction services in exchange for millions of tons of raw materials is making China the new symbiotic partner of many undeveloped countries. This effective and peaceful way toward national security contrasts starkly with the enormous military spending by the U.S. for "deterrence" and homeland security. Positioning the U.S. for world domination in military power ignores history. "Deterrence massively raises the stakes of conflict," says Khanna. Founded upon a hubris born of military superiority, the

strategies of "shock and awe," "surge" and "blitzkrieg" have all failed to achieve their ultimate objectives.

During World War II, U.S. military spending was $4.1 trillion in 2011 dollars, and 60 million lives were lost across the globe.[1,2] In the last four years, the U.S. has spent roughly $2.4 trillion on its military. Khanna says some of these funds could be better spent to create new infrastructure around the world that would strengthen U.S. supply chains and peaceful relationships. He beseeches the U.S. to wake up and amend its ways, and he posits that if all the global superpowers achieve self-sufficiency through peaceful, transparent and open trade, then détente will be automatic. Wars will simply be too expensive.

I find two faults with this book. Khanna treats climate change as if it were a mere rival of global resource development rather than as the existential threat that it is. He also fails to adequately address the two historically untamable threats to peace: religious zeal and population growth. If we are to ensure world peace for our grandchildren, we will need more than improved connectivity to tame these two threats.

Khanna concludes *Connectography* with this observation:

> When resources are widely distributed, governments are less likely to fear being cut off from access to precious raw materials, and thus to fight over them. There is no more need for resource wars. . . . But if we want to enjoy the benefits of a borderless world, we have to build it first. Our fate hangs in the balance.

I urge everyone to read *Connectography*. If offers an important and comprehensive new perspective on current world affairs. ◇

Email: brienseeley@gmail.com

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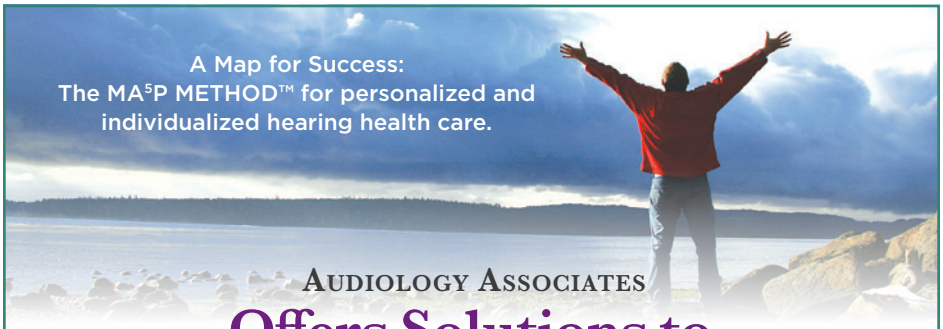

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TOP 10 REASONS
To Join SCMA and CMA

Working together, the Sonoma County Medical Association and the California Medical Association are strong advocates for all physicians and for the profession of medicine. Of the many reasons for joining SCMA and CMA, 10 stand out:

1 COMMITMENT TO THE PROFESSION
By joining SCMA and CMA, physicians affirm their commitment to the profession of medicine and to preserving its honored place in modern society.

2 IMPROVING COMMUNITY HEALTH
SCMA is involved in several initiatives to improve community health in Sonoma County, such as increasing access for the uninsured and bolstering primary care.

3 LEGISLATIVE ADVOCACY
By speaking with a united voice, SCMA/CMA members exert a powerful influence on the political process at the local, state and national levels.

4 FOSTERING COLLEGIALITY
SCMA and CMA bring doctors from all parts of the medical community together—through leadership, cooperation and social gatherings.

5 FREE MEDICAL-LEGAL INFORMATION
CMA offers free medical-legal information on contracts, subpoenas, employee relations, collections and many other topics.

6 PRESERVING MEDICARE
Thanks to SCMA, CMA and other medical associations, recent attempts in Congress to cut the Medicare reimbursement rate have all been rebuffed.

7 PROTECTING MICRA
SCMA and CMA work diligently to protect the Medical Injury Compensation Reform Act (MICRA), which safeguards low liability insurance rates for California physicians.

8 PRACTICE MANAGEMENT
SCMA and CMA offer a wealth of resources to help physicians manage their practices, implement electronic medical records and qualify for federal incentive payments.

9 STAYING IN TOUCH
Through their magazines, newsletters and websites, SCMA and CMA encourage physicians to stay in touch with each other and with current medical news and events.

10 IT'S EASY AND FUN
To join SCMA and CMA, go to www.cmanet.org/join. Once you belong, it's fun to get involved in medical society projects and events.

ASK YOUR COLLEAGUES
ABOUT SCMA AND CMA

One of the best ways to learn more about the benefits of membership in SCMA and CMA is to ask your colleagues. The physicians listed below have leadership roles at SCMA and would be happy to take your call.

President
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regina.t.sullivan@kp.org

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RIGHT NOW
is the best time to join SCMA and CMA.

- **Contact Rachel Pandolfi at SCMA**
  707-525-4375 or rachel@scma.org.

—OR—

- **Join online**
  at www.cmanet.org/join

S · C · M · A

CMA

NEW MEMBERS

INDEPENDENT

Stephen Lee, MD, Nephrology, 435 Doyle Park Dr., Santa Rosa, Boston Univ 2011

Anish Shah, MD, Psychiatry, 1260 N. Dutton Ave. #275, Santa Rosa, Sarda Patel Med Coll 1996

David Southwick, MD, Undersea & Hyperbaric Medicine, *Wound Care,* Santa Rosa, Univ Health Sci 1981

ST. JOSEPH HEALTH MEDICAL GROUP

Michael Rosedale, DO, Family Medicine*, 500 Doyle Park Dr. #G04, Santa Rosa, Western Univ 2008

THE PERMANENTE MEDICAL GROUP

401 Bicentennial Way, Santa Rosa

Alejandro Casillas, MD, Emergency Medicine, Univ Southern California 2008

Douglas Green, MD, Vascular Surgery*, Harvard Med Sch 1997

Eiman Jahangir, MD, Cardiovascular Disease, Univ Tennessee 2005

Mark McManigle, DO, Family Medicine*, Coll Osteo Med Pacific 1998

Christopher Styles, MD, Emergency Medicine, St. Louis Univ 2013

Patrick Wuthrich, DO, Emergency Medicine, Touro Univ 2012

* board certified
italics = special medical interest

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I am 100% committed to assisting the new owner with all the support necessary to ensure a smooth transition. Please contact me for more information or to schedule a visit. Gail Altschuler, MD, 415-309-6258 or drgail@marinweightloss.com.

PERSONAL HISTORY

Subterranean Homesick Bells

Rick Flinders, MD

I don't know about you, but I found kindergarten to be a jarring and unexpected interruption of my chosen lifestyle. At two I'd discovered I was an autonomous being. By three I was pretty much master of my own domain. At four I had settled into a perfect work-life balance. I played, I explored, I discovered. When I was hungry, I ate. When I got tired, I went to sleep. But then, at five, my mom told me I had to go to kindergarten.

Every morning I was awakened by a truly alarming bell from my alarm clock. I couldn't wear my jeans or T-shirt. Instead, I had to put on terribly brown corduroy pants and wait outside our house for a bus. But the worst part was—get this—*I couldn't even take my dog.* Where the hell was I going? The bus was big and yellow and full of yapping kids, and it dropped us off at school where, guess what, there were more bells.

Bell rings, we go into class. Bell rings, we go out to recess. Bell rings, we go back to class. Bell rings, we have graham crackers and milk. Bell rings, we lie down on our mats. Bell rings, we get back on the bus and go home. Try explaining this to your dog. "Don't worry," I told her, "they said it'll be over in June."

And they were right. But what they didn't say was that in September we had to do it all over again.

"What for?" I asked.

"First grade," they said.

"Well, how many of these ARE there?"

"Eight."

"EIGHT?!" I cried. "Then what?"

"Well, four of high school . . . then four of college . . . and, if you want to be anything special, probably four more, but you don't get your summers off. And if you want to be a speciaLIST, it's another three to five . . . "

You know the rest. Twenty years of schooling and they put you on the day shift. (Some nights, too.) Way I figure it, I've been answering that bell now for 65 years, ever since I was five years old. And all that bell's modern progeny: phones, sirens, beepers, alarms, ring tones, pagers and notifications. But I'm not complaining. Mostly, I feel grateful for the privilege and the adventure, of getting to do what I've done.

But now . . . I look forward to my earlier way of life . . . with a little more wisdom, a little more freedom to choose my own work, at my own pace. Without the hurry, without the worry . . . and certainly without the bells. ◇

Email: rickflinder@gmail.com

Dr. Flinders, inpatient director of the Santa Rosa Family Medicine Residency Program, serves on the SCMA Editorial Board.

SONOMA COUNTY MEDICAL ASSOCIATION
S·C·M·A

Practice Managers Forum

A LOCAL NETWORK FOR SCMA/CMA MEMBERS AND THEIR STAFF

Seeking strategies for your practice?

to become or remain competitive in today's marketplace!

Free membership for SCMA members and staffs

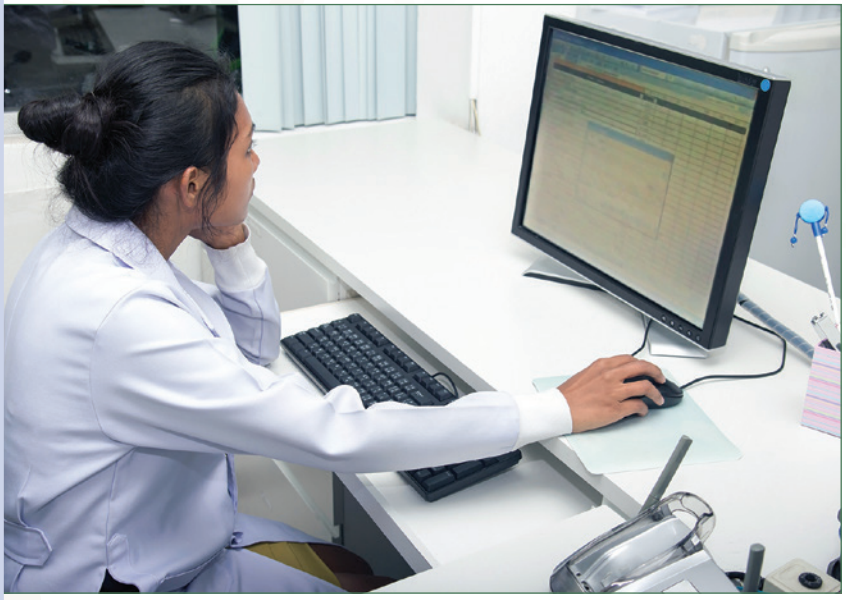
Join SCMA's NEW—Practice Managers Forum

a collaborative network designed to provide professional development opportunities and solutions to challenges that come with managing an independent practice.

Many independent practices are thriving today, despite challenges posed by health care delivery reforms. Equipped with basic business knowledge and skills, physicians are demonstrating that it is still possible to have a successful and rewarding private practice. Some are even opening new solo and small group independent practices.

The Practice Managers Forum (PMF) offers a wide array of activities and access to information covering issues and areas of common interest. Practice managers will benefit from:

- A countywide **network of practice managers.**
- Specially designed seminars and workshops, featuring the **Lunch & Learn series** and other **Essentials for Independent Practice seminars.**



- **Direct access** to valuable information:
  - **CMA Practice Resources (CPR),** a free monthly e-mail bulletin with tips and tools.
  - **CMA's Center for Economic Services,** including a toll-free helpline for assistance with reimbursement and contracting matters.
  - **CMA On-Call** documents containing helpful medical law information.
  - **CMA Resource Library & Store** of publications; webinars; and downloads of timely topics such as payor profiles, Medicare quality reporting programs, and new tobacco products.

To become a PMF member, just send your name, title, phone and email address (and if you're not a physician, the name of the physician you work with) to Rachel Pandolfi at **rachel@scma.org**. Questions? Call Rachel at **707-525-4375**.

Connect and communicate with your colleagues!

Lunch & Learn Seminar

New Laws for 2017
and How They Will Impact Your Practice

Wednesday, Nov. 2, 2016
11:30 a.m. – 1 p.m.

■ Partnership HealthPlan ▪ 495 Tesconi Circle, Santa Rosa, CA 95401 ■
■ $20 registration fee includes complimentary lunch ■

PRESENTED BY CMA LEGAL

RETURN REGISTRATION BY: **Fax:** 707-525-4328 • **Email:** rachel@scma.org
Mail: SCMA, 2312 Bethards Dr. #6, Santa Rosa 95405

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Questions?
■ Contact Rachel Pandolfi at 707-525-4375 or rachel@scma.org ■

Please help us prioritize speakers for future lunch and dinner programs by checking your top five topics of interest:

____ Analyzing your managed care contracts
____ Avoiding and preventing embezzlement
____ Customer service successful practice
____ Fundamentals for practice managers
____ Getting paid: a physician's guide to taking charge of accounts receivable
____ How it's being done: successful solo practices in 2016
____ How to reduce medical practice overhead
____ Knowing your options: benefits of merging, buying, selling, and other strategies
____ Managing difficult employees and reducing conflict
____ Managing up: masterful management for your physicians
____ Managing your online presence
____ MBA for MDs and managers (three-part series)
____ Medicare changes for 2017
____ Re/negotiating PPO contracts
____ Reducing overhead and increasing profitability
____ Survival skills to thrive in independent practice
____ Tips to avoid practice management hypertension

CMA
California Medical Association

ARE YOU READING CPR?

CPR contains the latest in Practice Management Resources, Updates and Information.

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Your Voice for Change

Regina Sullivan, MD

Here's a question I like to ask my colleagues when I'm speaking about membership in the Sonoma County Medical Association: Are you satisfied with the frequently changing rules and regulations made by non-physicians governing your career in medicine? If your answer is anything besides YES!, I then ask what would **you** change to increase your satisfaction? What are your ideas, solutions or recommendations? Next, how would **you** go about making those changes? Where would you start? You're just one person, one voice.

When you join SCMA, your voice gets amplified and becomes a strong catalyst for change. You can bring your ideas to a forum of your peers—other doctors just like you and me—and contribute to making positive improvements to our profession and to the health of our patients.

We practice medicine to deliver quality health care to our patients. We understand our patients' needs, and we advocate for them every day. Yet when it comes to the leadership in health care, we often bury our heads in our charts and leave it to someone else. To foster change, to have our voices heard, we need to sit at the table with the decision makers. SCMA has been there for us to do just that. It's our voice in medicine in Sonoma County and, through the California Medical Association, the entire state of California.

As shown by the accompanying table, 54% of the practicing physicians in Sonoma County already belong to SCMA, but we have plenty of room to grow. Our goal is to increase membership to 60% by next summer.

If you'd like to join SCMA and CMA, here are just a few of the many benefits of membership:

- SCMA is involved in several initiatives to improve community health in Sonoma County, including Sonoma Health Action, the Committee for Health Care Improvement, the My Plan/My Care advance directives project, the Hearts of Sonoma CVD risk-reduction program, anti-tobacco efforts, oral health initiatives, safe prescribing of opiates, and much more.
- SCMA advocates for improved access to care for all local residents and participates in health access programs with community partners such as Covered Sonoma and the Specialty Access Improvement Project.
- CMA's reimbursment experts have recouped $10 million from payors on behalf of physician members over the past five years.
- SCMA and CMA work diligently to protect the Medical Injury Compensation Reform Act (MICRA) and spearheaded a successful campaign to defeat the anti-MICRA Prop 46 in the 2014 election.
- CMA's professional economic advocates and practice-management experts offer free one-on-one small-practice resources, such as complying with regulations, analyzing contracts and billing, and helping with payment problems. They're on-call at 800-786-4262.
- CMA and SCMA are advocating for several 2016 ballot initiatives, including increasing California's tobacco tax (Prop 56) and reducing gun violence (Prop 63).

Join **your** voice with those of your colleagues. Our collective voice is significantly more powerful than a single one. You can make a difference. Rediscover your passion: Your patients and your profession will thank you! ◇

SCMA Membership

PRACTICE TYPE	Physicians	SCMA	%
Solo Practice	261	85	33%
Small and Medium Groups (2–10 physicians)	122	32	26%
Large Groups (>10 physicians)	709	476	67%
Total	1092	593	54%
LARGE GROUP MEMBERSHIP			
Analgesia & Anesthesia Medical Group	39	3	8%
Community Health Centers/Government	47	10	21%
Northern California Medical Associates	37	26	70%
Redwood Radiology Group	15	15	100%
St. Joseph Health Medical Group	87	54	62%
Santa Rosa Memorial Hospital	17	1	6%
Sutter Family Medicine Residency	48	42	88%
Sutter Medical Group of the Redwoods	81	19	23%
The Permanente Medical Group	338	306	91%

Dr. Sullivan, an ob-gyn at Kaiser Permanente Santa Rosa, is president of SCMA.

Email: regina.t.sullivan@kp.org

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